THE RELATIONSHIP BETWEEN CHANGES IN CERTAIN FIRM CHARACTERISTICS AND THE CHANGES IN THE STRUCTURE OF TOP MANAGEMENT COMPENSATION PLANS (AS PRECIPITATED BY CONGLOMERATE MERGERS)

By

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TABLE OF CONTENTS

page

ACKNOWLEDGEMENT iii

ABSTRACT.....vi

CHAPTERS

I. INTRODUCTION.....1

II. REVIEW OF RELEVANT LITERATURE.....5

2.1 Studies Related to the Effects of Management Compensation on Managerial Decision Making.....5
2.2 Studies Related to the Design of the Structure of Management Incentive Compensation.....7
2.3 Relationship of this Study to Prior Studies.....8

III. CONCEPTUAL DEVELOPMENT.....12

3.1 Basic Agency Model.....12
3.2 Diversification Effect and the Managerial Incentive Problem.....15
3.3 Shareholders' Incentive Effects arising from Wealth Transfer.....19
3.4 The Influence of Degree of Ownership Control.....24
3.5 The Structure of Management Compensation.....27

IV. HYPOTHESES.....29

4.1 Hypotheses Related to the Diversification Effect.....33
4.2 Hypotheses Related to Shareholders' Response to Wealth Transfer.....39
4.3 Hypotheses Related to the Decision Horizon Gap between Shareholders and Managers.....44

page

V. RESEARCH METHODOLOGY....50

5.1 Data Collection....50
5.2 Experimental Design....54
5.3 Dependent Variable Measurement....55
5.4 Independent Variable Measurement....67

VI. EMPIRICAL ANALYSIS....72

6.1 Descriptive Statistics....72
6.2 Discussion of Results....78

VII. SUMMARY AND CONCLUSIONS 104

7.1 Summary and Conclusions....104
7.2 Limitations and Suggestions for Future Research....106

APPENDIX....111

REFERENCES....118

BIOGRAPHICAL SKETCH....124

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This study examines the effects of conglomerate mergers on the structure of executive compensation. Agency theory suggests that a conglomerate merger creates two types of agency problems--diversification effects and wealth transfer. The diversification effect induces top managers to reduce the level of effort after merger, while economic theory suggests that a conglomerate merger transfers wealth from shareholders to bondholders. Both effects provide shareholders an incentive to take measures to protect their interests.

It is hypothesized that shareholders will design and/or change the structure of management compensation plans in response to these agency problems. In particular, Hypothesis 1 suggests that, ceteris paribus, the incentive

portion of the management compensation package will be increased after merger in response to managerial moral hazard problems, and Hypothesis 2 predicts that the anticipated wealth transfer will drive shareholders to increase the use of market-based incentive compensation (relative to accounting-based). The strengths of these hypothesized changes in compensation are modified by the level of control (or change in control) that firm owners can exercise. Hypothesis 3, which is related to the decision horizon gap between shareholders and managers, posits that the long-term portion of compensation (relative to short-term) will change after merger.

These hypotheses were tested on a sample of 47 merger and 49 non-merger control firms. The results generally support all of the above hypotheses. That is, the change in the structure of management compensation packages of merger firms (from the year before to the year after merger) was found to be systematically different from that of comparable control firms, after adjusting for the effect of changes in the firm's earnings performance. The ownership control variables were generally insignificant in explaining the change in the structure of management compensation. These results, subject to certain identified limitations, are interpreted as an indication that shareholders design/change management compensation plans in an attempt to reduce agency problems.

CHAPTER I
INTRODUCTION

A great deal of research has been conducted about management compensation and its relationship to accounting measurement choices and operating decisions. Much of that research is concerned with the effect of changes in incentive compensation plans (resulting from the use of, or changes in, accounting methods) on executives' total compensation. Very little, however, has been done with respect to the design of the components of compensation and the resulting structure of compensation packages. In addition, the changes in compensation schemes that are, or should be, precipitated by major changes in the characteristics of the firm are not well understood.

The objective of this study is to examine the effects of dramatic changes in the firm's economic and operating conditions on the design and/or change of management compensation schemes. The event of a conglomerate merger between two firms is used as a vehicle that potentially gives rise to significant changes in the firm's characteristics. In examining this issue, two important aspects are considered. The first aspect pertains to the model developed by Ramakrishnan and Thakor (1984a), which showed that a conglomerate merger may lead to certain

managerial incentive problems. One goal of this study, therefore, is to test the hypothesis generated by the normative analysis of Ramakrishnan and Thakor (1984a). If, in fact, dysfunctional effects are expected to arise from a conglomerate merger, then either shareholders, or shareholders and managers jointly, will seek to adjust incentive compensation schemes so as to reduce the negative effects on the motivation of managers. Particular forms of adjustment in the structure of the compensation package are proposed and tested. The second aspect concerns the wealth transfer created by a conglomerate merger. Wealth redistribution propositions from financial economics suggest that a variance-decreasing merger transfers wealth from shareholders to bondholders. The change in the design of management compensation schemes in the presence of such bondholder-shareholder conflict of interests is examined and tested.

Hypothesis 1 posits that managerial incentive problems created by a merger will drive shareholders to increase the incentive portion of the management compensation package. Hypothesis 2 predicts that market-based incentive compensation will increase after merger (relative to accounting-based incentive compensation) in response to the anticipated wealth transfer problem. The magnitude of these hypothesized changes in compensation structure are modified by the level of control exercised by owners. The effect of this ownership control variable is twofold. First, it

interacts with both the diversification and the wealth transfer effects by mitigating or accentuating their magnitudes. Secondly, the change in ownership control changes the monitoring ability of the shareholders, which in turn influences the change in the design of management compensation plans. Hypothesis 3, which is related to the decision horizon gap between shareholders and managers, posits that the long-term portion of compensation (relative to short-term) will change after merger as a function of the change in ownership control.

These hypotheses were tested on a sample of 47 merger and 49 non-merger control firms. The results generally support all of the above hypotheses. That is, the change in the structure of management compensation packages of merger firms was found to be systematically different from that of comparable control firms after adjusting for the effect of changes in the firm's earnings performance. Ownership control variables were generally insignificant in explaining the change in the structure of management compensation. These results are interpreted as an indication that shareholders design/change management compensation plans in an attempt to reduce agency problems.

Although the inferences drawn from this study are limited in the sense that the analysis focused only on the agency problems created by a conglomerate merger, the aspects examined hopefully provide valuable clues toward building a general theory of compensation.

The rest of this study is organized as follows. Related prior literature is reviewed in Chapter II. Managerial incentive problems created by a conglomerate merger are discussed in Chapter III. Based on this, Chapter IV derives the hypotheses to be tested. The data collection procedures and the research method employed are discussed in Chapter V. Chapter VI discusses analyses of the empirical results and Chapter VII concludes the study with a discussion of the limitations and suggestions for future research.

CHAPTER II
LITERATURE REVIEW

This chapter discusses prior researches related to the management compensation area. The review is classified into two categories: i) studies that examined the relationship between the adoption of, or change in, management compensation plans and subsequent managerial decision making (i.e., the effects of management compensation), and ii) studies related to the design of the structure of management compensation plans. Each category of studies addresses different issues and thus is discussed separately. Then, in the final section, this study is compared with prior studies.

2.1 Studies Related to the Effects of Management Compensation on Managerial Decision Making

These studies are further grouped into two types. One type of study examines the extent to which the compensation effects of different accounting or investment alternatives influence executives' preferences over their choice of accounting or operating decisions. The other type of study focuses on the effects of the adoption of or change in the executive compensation package on managerial accounting and operating decisions. The literature dealing with the first

issue is summarized in Holthausen and Leftwich (1983); and Larcker (1983) is an example of the second type. Holthausen and Leftwich (1983) reiterate that managerial operating or accounting decisions are made in consideration of their effects on certain agency variables that affect managerial utility, such as political costs, bond covenants, and management compensation. The overall evidence suggests that management compensation variable was in general not significant in explaining managerial behavior. Larcker (1983) examined the association between the adoption of performance plans, changes in corporate capital investment, and security market performance. His results showed that firms adopting performance plans exhibited i) a significant growth in capital expenditure and ii) a favorable security market reaction to the announcement of plan adoption.

In relation to this study, some studies among the first group examined the compensation effects of executives' merger decisions. Larker and Balkcom (1984) examined the relationship between the characteristics of a compensation contract and merger decisions by managers. They found that the level and variability of accounting numbers and the variability of the market value of equity for acquiring firms (that result from a merger) are associated with the characteristics of the managerial compensation contracts (e.g., riskiness of the contract, etc.). Lewellen, Loderer and Rosenfeld (1984) hypothesized that managers' merger decisions are influenced by the effects of merger on their

compensation. They found that shareholders' wealth of the acquiring firm was positively related to the percentage of own-company stock held by managers. Also, Amihud and Lev (1981) reported that managers seek risk reducing conglomerate mergers to reduce their employment related risk. Generally, these studies argue that certain types or characteristics of mergers may be driven by the expected impact on the level of managerial compensation.

2.2 Studies Related to the Design of the Structure of Management Compensation

There are only a few studies that have dealt with the design of the structure (components) of management compensation plans. These studies examined the design issue under certain environmental settings (unrelated to mergers). Eaton and Rosen (1983) examined the relationship between the structure of executive compensation and the characteristics of the firm and risk attitudes of the executives. They found that relatively safe forms of delayed compensation (e.g., pensions) were used more intensively for older executives. On the other hand, younger executives were more likely to be compensated with stock options. They also found that certain firm characteristics (e.g., number of employees, asset size, advertising and R&D expenditures) were significant in explaining the cross-sectional differences in the composition of management compensation. Smith and Watts (1984) hypothesized that the investment opportunity set (growth options) faced by a firm influenced

the level and composition of the compensation contract. Their results showed that managers in industries with more real investment options earn a higher level of compensation. Also, the percentage of firms that use incentive type contracts was higher in such industries. Antle and Smith (1984) tested a prediction based on agency theory that relative performance evaluation is an efficient means of motivating risk averse executives because it allows common uncertainty to be filtered out of performance evaluation. Although the results do not seem to be strong, they found that i) executives are compensated as if a distinction is made between the "systematic" and "unsystematic" components of firm performance, and ii) changes in executive compensation are more associated with changes in the firm specific performance than with changes in systematic performance.[1]

The implication of the above studies is that the environment of a firm (or a change in that environment) should be considered as an endogenous variable in the study of management compensation.

2.3 Relationship of This Study to Prior Studies.

In contrast to former studies which have used change in compensation (or compensation effect) as an independent variable, this study uses it as a dependent variable or phenomenon to be explained. Further, the focus of the former studies was on the level of compensation, whereas

this study focuses on the structure (relative composition) of management compensation packages. A potential problem with former studies is that their results are difficult to interpret because they are consistent with alternative hypotheses. For example, Lewellen, Loderer and Rosenfeld (1984) interpreted their result (a positive relationship between shareholders' wealth after merger and managerial stock holdings) as an indication that the managers' behavior regarding merger decisions is determined by the expected impact of their decisions on their compensation. Raviv (1984), however, argues that this result is also consistent with a signaling hypothesis. That is, managers will attempt to signal that their merger is a high net present value transaction by taking a long position in the firm's equity. This will be observed by the market, which will react by increasing the price of the firm's stock. Thus, the stock appreciates as a result of the management's signal (increased position in the firm's shares).

In the absence of underlying theory, studies that examine the compensation effect generally tend to be mere ex-post documentation of the effects of adoption of, or change in, management compensation plans. What we need at this juncture is an understanding of why, and under which firm- or industry-specific characteristics, the various contractual structures will be employed. With this understanding, the results of prior studies might be better interpreted. This assertion, however, does not negate the

observed relationship between the adoption of (or change in) management compensation schemes and subsequent effects. In fact, compensation schemes are designed in anticipation of subsequent effects. In this sense, the studies that examine the compensation effects and those studying the ex-ante design issue are inter-related. The following insightful comment by Raviv (1984, p. 241) suggests an appropriate direction to compensation researchers:

> A good theory will provide an explanation of the firm's decisions regarding the compensation package offered to management while taking into account the fact that the manager's decision will be affected by the contract chosen.... The methodology for developing such a theory is fairly clear. We need to specify the production technology, the environmental and information structure of the firm, and the preferences of the various economic agents. Then, efficient compensation contracts will be derived taking into account the behavior of managers operating in the specific environment and facing the above compensation schemes.

Although there exist some studies that examine the design of the structure of management compensation, they have generally not succeeded in explaining the structure of management compensation in significant detail. Smith and Watts (1984) only examined the existence of various types incentive plans, and Eaton and Rosen (1983) did not separate fixed salary from bonus. Also, their focus was on deferred compensation, which is only one component of compensation structure.

In this study, the design issue of management compensation structure is elaborated in detail. If management compensation is a solution to agency problems,

each component of a management compensation plan has its own intended purpose. For example, the salary and bonus components serve different purposes. Mixing the components whose purposes are different will obscure the relationship between underlying agency problems and related compensation responses. This study separates each component of the management compensation package and tests whether or not its intended purpose has been accomplished. Management compensation is variously broken down into fixed salary versus incentive portion, market based versus accounting based incentive portion, and short-term versus long-term portions. Each component of the compensation package is then related to the underlying agency problems that it intends to resolve.

2.4 Note

1. Systematic and firm-specific components were defined as those related to the market or industry factors, and firm specific performance, respectively.

CHAPTER III
CONCEPTUAL DEVELOPMENT

This chapter establishes the conceptual underpinning for the hypotheses to be developed in Chapter IV. In the first section, the basic agency model is introduced and extended to the Ramakrishnan and Thakor (1984a) propositions which predict potential managerial moral hazard problems as the result of a conglomerate merger. The second section discusses the wealth transfer theory and relates it to management compensation. The degree of ownership control is then introduced in the following section and its modifying effects on managerial agency problems are examined. The last section analyses the structure of management compensation plans. Each component of the plan is functionally classified and related to the managerial agency problems it is designed to resolve.

3.1 Basic Agency Model

The basic agency model (composed of one principal and one agent) typically assumes the following:

i) The principal owns the firm but does not directly participate in its operation. The principal hires an agent (manager) and delegates operating responsibility to the agent.

ii) The agent is risk averse. If the agent is risk

neutral, no incentive problem arises (Harris and Raviv, 1979).

iii) The agent has disutility for effort.

iv) The agent's choice of an action is not observable to the principal who owns the firm but does not directly participate in its operation. The only variable observable to both parties is the outcome, x. Thus the compensation contract, s(.), can be made only as a function of outcome, s=s(x). This assumption rules out contracts which are not incentive compatible.

v) Both parties are rational and maximize expected utility. The principal's utility function is expressed as $U_p=G[x-s(x)]$. The agent's utility function, which is assumed to be separable in action and income, is expressed as $U_A[s(x)]-V(a)$. $U_A(.)$ represents the utility function of the agent, and V(.) the agent's disutility for effort level "a".

vi) The outcome is a function of the agent's action choice and a random state θ, i.e., $x=x(a,\theta)$.

Given these assumptions, the agent's problem is to choose an optimal action, a, that maximizes his expected utility given the compensation contract. The principal's problem is to design an incentive contract that maximizes his expected utility while retaining the agent's services. Notationally, the model is as follows:

$$\underset{s(x),a}{\text{Max}} \; E\{G[x-s(x)]\} \tag{1}$$

$$\text{subject to } E\{U[s(x),a]\} \geq \bar{U}_A \tag{2}$$

$$a \in \underset{a' \in \Omega}{\text{argmax}} \; E\{U[s(x),a']\} \tag{3}$$

where a' represents a particular action that the agent chooses among the total set of actions available (Ω), and argmax denotes the set of arguments that maximize the objective function that follows. The constraint in equation (2) guarantees the agent a minimum expected utility, $\bar{U}_A$ (attained via a market or negotiation process). Equation (3), referred to as the agent's action self-selection constraint, specifies that the agent will choose an action that maximizes his expected utility, given the principal's choice of the payment schedule. The solutions to equations (1) and (2) achieve the "first best", and the solutions to (1), (2) and (3) achieve the more realistic "second best" result. The second best solution as formulated above assumes that the agent's effort is prohibitively costly to monitor. In reality, however, varying degrees of costly monitoring may be feasible. One of the factors that may affect the degree of monitoring is the level of control exercisable by owners, which measures the degree of commonality (alternatively, separation) of ownership and control. In the following sections, the agency problems created by a conglomerate merger are described.

3.2 Diversification Effects and the Managerial Incentive Problem

Ramakrishnan and Thakor (1984a) showed that the pre-merger second best contract may not be optimal after a (conglomerate) merger. Their analysis is summarized and presented below. In addition to the typical assumptions of the basic agency model, the following assumptions are made:

i) Managers are risk averse, and shareholders are risk neutral. The manager's utility function is expressed as $U_A=U(w)-V(a)$, where w represents the manager's payoff.

ii) Two firms of equal size but whose earnings are uncorrelated (or negatively correlated) with each other merge and form two divisions of the merged firm.

iii) Each division manager can monitor the other's action after merger. Under this situation, the risk-averse managers will agree to equally share the total work load and pool their individual payoffs in order to lessen their risk exposure. Thus, each manager's payoff becomes a function of the new firm's total pooled output.

iv) There are only two possible outcomes, high (H) and low (L).

If the manager's compensation is a function of earnings (output), the pre-merger payoff function of each manager will be given as follows:

Z if $\pi = H$

X if $\pi = L$

where π represents the output function and the probabilities of high and low output states occurring given an effort level, a, are defined as prob $(\pi=H/a) = p(a)$ and prob $(\pi=L/a) = 1-p(a)$, respectively.

Suppose, now, that the shareholders want the manager to choose some action, $\hat{a}$, which was chosen arbitrarily and hence need not be optimal for the second best case. The task of the shareholders is to design an incentive contract such that manager's welfare is maximized by choosing $a=\hat{a}$. That is, the following incentive compatibility constraint must be satisfied:

$$p_a(\hat{a})[U(Z)-U(X)]-V_a(\hat{a}) = 0 \qquad (4)$$

where subscript a represents the first derivative with respect to a.

In addition, the contract should guarantee, at a minimum, that the manager's expected utility equals or exceeds that obtainable elsewhere.

$$p(\hat{a})U(Z)+[1-p(\hat{a})]U(X)-V(\hat{a}) \geq \bar{R} \qquad (5)$$

where $\bar{R}$ represents the expected utility that the manager could receive by selling his services to the market.

Now, defining $t(.)= U^{-1}(.)$, the shareholders' objective function becomes:

$$\underset{X,Z}{\text{Min}} \{p(\hat{a})t[U(Z)] + [1-p(\hat{a})]t[U(X)]\} \qquad (6)$$

The pre-merger second best contract under this formulation is given by

$$U(Z) = \bar{R}+V(\hat{a})+[1-p(\hat{a})]V_a(\hat{a})[p_a(\hat{a})]^{-1} \quad (7)$$

$$U(X) = \bar{R}+V(\hat{a})-p(\hat{a})V_a(\hat{a})[p_a(\hat{a})]^{-1} \quad (8)$$

(Refer to Ramakrishnan and Thakor (1984) for derivation).

Now, if the pre-merger incentive contract continues to be used after the merger, each manager's payoff will be given by

$$\begin{array}{ll} Z & \text{if } \pi_1=\pi_2=H \\ Y \equiv \frac{(X+Z)}{2} & \text{if } \pi_1=H,\ \pi_2=L \text{ , or } \pi_1=L,\ \pi_2=H \\ X & \text{if } \pi_1=\pi_2=L \end{array}$$

where subscripts 1,2 represent the two divisions, respectively.

Each manager's expected utility will then be

$$\begin{aligned} U_A[s(\pi),a_1,a_2] = {} & p(a_1)p(a_2)U(Z)+ \\ & \{p(a_1)[1-p(a_2)]+p(a_2)[1-p(a_1)]\}\ U(Y)+ \\ & \{[1-p(a_1)][1-p(a_2)]\}\ U(X)-V\left[\frac{a_1+a_2}{2}\right] \end{aligned} \quad (9)$$

where $s(\pi)$ represents the manager's payoff function.

If the probability of obtaining high output at the desired level of effort is reasonably high, it can be shown that differentiating (6) with respect to a_1, the evaluation at a_1 $(=a_2=\hat{a})$ becomes

$$U_{a_1}[s(\pi), \hat{a}, \hat{a}] < 0 \quad (10)$$

This result shows that if managers are awarded the same incentive contract that was optimal (second best) before the merger, each manager may find it optimal to choose a level of effort after the merger that is lower than the desired

level, $\hat{a}$. Decreasing the effort level from "$\hat{a}$" after merger increases the manager's expected utility. This can be clearly illustrated by means of a simple numerical example. Assume the probability of obtaining low and high output, given an effort level, is given by $p(\pi=L/a)=1-p(a)=1-1/100a^2$ and $p(\pi=H/a)=1/100a^2$, respectively, where $0 \leq a \leq 10$. The pre-merger desired level of effort is assumed to be 9. Thus, under this assumed effort level, there is an 81 percent chance of obtaining high output state. The manager's utility function is assumed to be $U_A = U(w) - V(a) = w^{\frac{1}{2}} - 1/50\ a^2$ and the utility he can obtain elsewhere by selling his labor is assumed to be $\bar{R} = 5$. Solving for (7) and (8), the pre-merger second best contract is: Z=49 and X=25. Based on this, the manager's pre-merger expected utility is then computed as $p(\hat{a})U(Z)+[1-p(\hat{a})]U(X)-V(\hat{a})=5$.

Now, if the same contract continues after merger, each manager's expected utility after merger can be computed using equation (9). The utilities for selected effort levels are shown in Table 3.1 below.

Table 3.1
Managerial Incentive Problems arising from the Diversification Effect

Effort Level $0 < a < 10$	Manager's Expected Utility before merger	after merger
10		5
9.5		5.019
9	5(second best)	5.025
8		5.038
7.07		5.042(maximum)
1		5.002

The table shows that, if the pre-merger contract is used after merger, an expected utility maximizing manager will choose the effort level of 7.07, which is lower than the level desired by the shareholders.

This incentive argument provides formal support for Amihud and Lev's (1981) conjecture that while conglomerate mergers benefit managers, they may make shareholders worse off in some cases. As is done here, in Amihud and Lev's analysis, managerial incentive contracts are held fixed regardless of any ex post alteration in the firm's risk characteristics through activities such as mergers. However, shareholders (represented by the Boards of Directors) need not be so passive. They can protect their wealth by altering incentive contracts after merger. Thus, we expect that the "performance contingent" or "incentive" portion of total compensation will be increased after merger. The theory presented above allows us to interpret any empirically observed increase in incentive portion after merger as being precipitated by the incentive problems created by a conglomerate merger. Related hypotheses are developed in Chapter IV.

3.3 Shareholders' Incentive Effects arising from Wealth Transfer

Many empirical studies have looked at the effects of mergers on shareholder wealth. These studies, in general, report significant excess returns to the target firm's stocks but generally no significant excess returns to the

bidder's stocks. More recently, wealth redistribution theories have examined the value of outstanding debt and common stock simultaneously, and have suggested that in a nonsynergistic or conglomerate merger, bondholders gain and shareholders lose. This redistribution of wealth from stockholders to bondholders results from a decrease in the variance of returns (or cash flows) of the combined firm. Two theoretical efforts predict a transfer of wealth from stockholders to bondholders in a nonsynergistic merger: the cash flow model of Higgins and Schall (1975), and the option pricing model of Galai and Masulis (1976).

Higgins and Schall (1975) showed that a coinsurance effect arising from the less than perfect correlation of the cash flows of merging firms reduces the default risk of outstanding debt. They argued that, if the amount of debt is held constant, the total value of the combined firm does not change, and thus wealth is transferred to bondholders from shareholders. They further argued that even if the amount of debt is allowed to vary, this does not necessarily increase shareholders' wealth unless the wealth transfer to the bondholders is more than offset by the incremental tax subsidy to increased debt. In the Galai and Masulis (1976) model, wealth redistribution results from the anticipated decrease in the variance of the merged firm's returns. The variance of the merged firm's returns is a weighted average of the pre-merger variances of the merged firm's returns and the covariance of their returns. If the correlation

coefficient between the firms' returns is sufficiently low (or negative), this decrease will generally occur. Assuming that a conglomerate merger does not in general result in economic synergy, Galai and Masulis showed that the decrease in variance leads to a decrease in shareholders' wealth and an increase in bondholders' wealth.

However, empirical results pertaining to the wealth redistribution hypothesis are ambiguous. Kim and McConnell (1977) and Asquith and Kim (1982) reported no significant change in bond values as a result of conglomerate merger. However, the former authors conjectured that the possible wealth transfer may have been negated by the mitigating measures taken by shareholders. Eger (1983) noted that the failure of the above two studies to observe wealth transfer could be due to inappropriate tests of the theory. Focusing only on pure stock exchange mergers and using sample firms with equal variance and no significant changes in leverage, she found results that supported the wealth redistribution theory. Her findings imply that the redistribution theory is conceptually sound, but that the detection of wealth transfer may be difficult due to shareholders' responses.

There are four possible actions that shareholders can take to protect their wealth from being transferred. First, they may call or purchase the outstanding debt of the unmerged firms (without penalties), and then issue new debt for the merged firm at a lower interest rate after merger. This will increase the income stream to the equity holders

(Higgins and Schall, 1975). Secondly, they can use debt instruments as a medium of exchange in mergers, and a third possibility is to issue additional debt after merger with the same seniority and retire a certain fraction of the merged firm's equity (Galai and Masulis, 1976). Finally, shareholders may induce managers to invest more in variance increasing projects (Jensen and Meckling, 1976). However, these shareholder wealth protection measures may not materialize unless the managers who are in control of operating decisions actually engage in such activities when conflicts of interest exist between bondholders and shareholders. Managers, as expected utility maximizers, may not choose to protect shareholders' wealth unless by doing so they can increase their own welfare as well. This dilemma is apparent in the wealth redistribution literature. Higgins and Schall (1975, p. 100) suggested that "the only way shareholders can avoid this windfall loss is to call or purchase all of outstanding debt without penalty. If in this manner, the shareholders are successful in eliminating the windfall gain to creditors, shareholders will be unaffected by conglomerate merger (emphasis added)." Kim and McConnell (1977, p. 349) are more explicit. They argue: "If firms are either controlled by shareholders or if managers at least seek to maintain shareholders' wealth...we would expect that merging firms do take steps to neutralize this wealth transfer (emphasis added)." In a similar vein, Smith and Warner (1979, p. 154) noted: "We have ignored other

conflicts, such as that between managers and stockholders, which also exist. To the extent that the contracts comprising the firm are interdependent and simultaneously determined, the bondholder-stockholder conflicts should not be viewed in isolation. The impact of bondholder-stockholder conflicts...can not be fully understood until the nature of these contractual interdependencies is explored."

The above arguments suggest the possibility of changes in the firm's management compensation scheme as a solution to the agency problem between bondholders and shareholders (the anticipated wealth transfer that is) created by a conglomerate merger. As discussed above, shareholders' wealth will be best protected if we assume that managers follow a shareholder wealth maximizing (or maintaining) rule when bondholder-shareholder conflicts exist. Since this naive assumption is not always warranted, shareholders may take explicit actions to ensure that managers follow a rule which protects their wealth. This can best be achieved by more directly aligning managers' welfare with that of shareholders. In this study, market-based incentive compensation is proposed as a solution to this problem. This derives the second hypothesis in Section 4.2

3.4 The Influence of Degree of Ownership Control

Firm behavior under alternative ownership structures (degree of control exercisable by owners) has been widely examined. These studies, in general, suggest that the behavior of a firm (or its managers) may vary to the extent that shareholders can influence managerial operating decisions. The topics examined in these studies include the followings: Revenue maximization theory (Baumol, 1958; Amihud and Kamin, 1979; Palmer, 1973). Expense preference theory (Williamson, 1964), and differential managerial risk attitudes under different ownership structures (McEachern and Romeo, 1978; Monsen and Downs, 1965), and managerial accounting decisions (Smith, 1976; Salamon and Smith, 1979).

The sources of the problems that give rise to the above differences in managerial/firm behavior under different ownership structures includes i) the degree of unobservability of managers' behavior, ii) the manager's differential risk exposure, and iii) differential decision horizons between managers and shareholders. In this study, agency problems arising from unobservability and differential decision horizon issues are examined in particular.

As was shown in Section 3.1, the agency model includes the agent's action "a" as one of its arguments. However, the theory is not clear on what "a" means and the degree to which "a" can be monitored. For workers in a production setting, action "a" may be interpreted as the level of

effort. However, the level of effort may only be an approximate and perhaps an inaccurate representation of a top executive's activities. Managerial activities have more to do with the quality than the quantity of their actions. In this study, managerial action is intended to reflect both quality and quantity. In the absence of proper control mechanisms or motivation schemes, managers may make decisions which increase their own utility at the expense of shareholders, or may not take actions that protect shareholders. An example of the former case is the use of corporate resources to increase managerial perquisites. An example for the latter is the rejection of firm-variance increasing projects after merger.

Possible solutions to these agency problems center on monitoring and/or motivation. In general, shareholders use these two alternatives individually or jointly according to the particular situations they face. Use of one reduces the need for the other. In this study, shareholders' monitoring ability is measured by the degree to which shareholders are separated from ultimate control (ownership structure), and the motivation scheme is represented by the various incentive plans.

The effects of ownership structure are twofold. First, it affects the overall need for motivating (incentive) schemes. In general, in "owner-controlled" firms (i.e., when the degree of control by owners is high), the possibility of close monitoring reduces the need for

motivational devices relative to the need in "manager-controlled" firms.[1] Secondly, it interacts with the agency problems created by a conglomerate merger. In owner-controlled firms, the agency problems arising from a conglomerate merger will be mitigated because shareholders can exercise close monitoring, while such problems will be accentuated under manager-controlled firms. An extreme example of the former case is the pure owner-manager firm in which a single owner is also the manager. In this case, the agency problems will be completely eliminated by the ownership structure because ownership and manangement are equivalent.

A differential decision horizon problem arises because the manager's decisions may be evaluated on the basis of a short-term measure of performance (as is typically the case in the U.S.). Stockholders' claims on the other hand are tradable claims on the entire future stream of net cash flows. To maximize the market value of these claims, a manager must consider the effects of his alternative decisions on the firm's cash flows for the remaining life of the firm. The manager, however, will be concerned with the cash flows that affect his performance measures, which are typically more heavily weighted by short-term considerations. This difference in decision horizon between owners and managers will also be a function of ownership structure. Ceteris paribus, managers of manager-controlled firms would exhibit more short-term oriented behavior than

would those of owner-controlled firms. Managers of owner-controlled firms, although they may have similar potential timing horizon differential with the owner, might not focus as much on short-term oriented activities if they realize that their behavior is closely monitored by the controlling owners. Thus, if a conglomerate merger results in a change in the ownership structure of a firm, the agency problems arising from the decision horizon gap are also expected to be modified. Hence, a change in the long-term portion of compensation is proposed as a solution to this decision horizon gap that results when ownership structure changes as a result of a merger (see Section 4.3 for related hypothesis).

3.5 The Structure of Management Compensation Contracts

Management compensation contracts typically include salary, annual bonus, stock options, stock appreciation rights, restricted stock and performance plans and other fringe benefits. The composition of these contracts may be designed to resolve the agency problems discussed above. Certain classifications of the contract components, as suggested below, assist in this task.

Compensation contracts are first dichotomized into non-incentive and incentive types. Non-incentive contracts include annual fixed salary and fringe benefits which are institutionally determined. Typical incentive contracts are annual bonuses, stock options, stock appreciation rights,

restricted stock and performance plans. These contracts have incentive effects because the compensation under these contracts is contingent on the manager's performance.

Incentive contracts are further classified into accounting and market based contracts according to the type of performance measure, or into short-term and long-term contracts according to the time horizon of the performance measure.

Accounting-based contracts include annual bonuses and performance units, and are a function of the firm's operating cash flows (ignoring accounting accruals). Market-based contracts include stock options, stock appreciation rights, performance shares, restricted stock and phantom stock, and are contingent upon the stock market performance of the firm. Smith and Watts (1984) argue that among the market based contracts, stock options and stock appreciation rights are particularly well suited to control managerial risk aversion. Since the expected payoff to these option type contracts increases with the volatility of the stock price, they provide the manager with an incentive to invest in variance increasing projects. Restricted stock and phantom stock plans have fewer option characteristics than stock options or stock appreciation rights. Smith and Watts also argue that bonus and performance units resemble stock options except that they are options on operating cash flows instead of on stock performance. The specified level (earnings per share, percentage of equity or total capital)

that earnings must reach for a bonus or performance unit to be awarded is similar to the exercise price of the stock. However, the former (accounting-based compensations) is different from the latter (market based compensations) in that the former is a function of a firm's total operating cash flows (ignoring accounting accruals), whereas the latter is a function of a firm's residual cash flows. Further, option characteristics of bonus or performance units may be significantly limited if upper bounds exist in the plans.

Incentive contracts can be also divided into short-term and long-term contracts along the time horizon dimension. Short-term contracts include annual bonuses which are a function of accounting numbers measured over a single year. In contrast, stock options, stock appreciation rights, restricted stocks and performance units (shares) are based on some long-term performance measure.

The above two dimensions (performance measure and time horizon dimensions) are considered the most important factors in designing a management compensation package. The executive compensation consulting firm of Booz, Allen and Hamilton Inc. proposes that a management compensation package should be structured in such a way that its risk posture and time focus are closely related to those of the firm.

The alternative classifications of the compensation contracts discussed in this section are summarized in Figure 3.1.

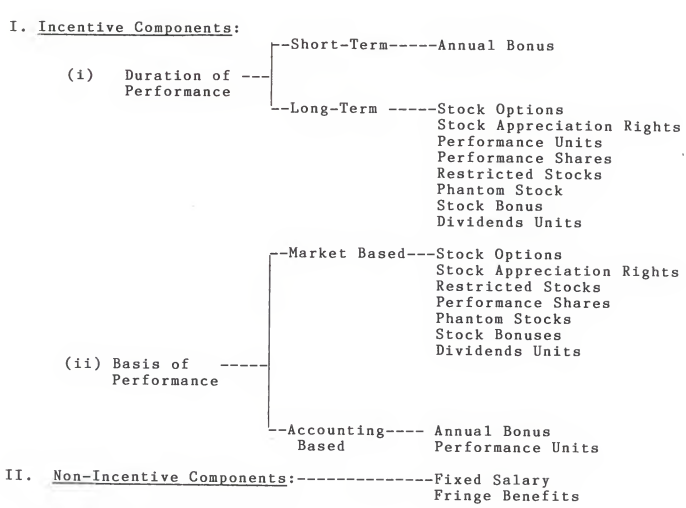


Figure 3.1 Classifications of Management Compensation Contracts

3.6 Note

1. As will be discussed further in Chapter V, ownership structure can be measured in several ways. Owner-controlled firms are those firms whose ownership interests are concentrated in the hands of the controlling shareholder(s). On the other hand, the ownership interests in manager-controlled firms are so diffused that the control of the firm is virtually in the hands of the management. Since the measurement issue is not important at this point, these general terms will be used for illustrative purposes to represent the degree of separation of shareholders from the ultimate control of the firm.

CHAPTER IV
HYPOTHESES

This chapter derives the formal hypotheses from the underlying theories discussed in the previous chapter. Hypothesis 1 suggests a resolution to Ramakrishnan and Thakor's (1984a) proposition that a managerial moral hazard problem results from a conglomerate merger. Hypothesis 2 is derived from the wealth transfer theory. Hypothesis 3 is related to the decision horizon gap between the shareholders and managers. The models used to test these hypotheses are also discussed in this chapter.

4.1 Hypotheses Related to the Diversification Effect

As was discussed in Section 3.2, Ramakrishnan and Thakor (1984a) showed that if management compensation is based on earnings, the optimal second best contract before the merger may not remain optimal after the merger. This occurs because the pooling of earnings after merger between firms whose earnings are uncorrelated reduces the variability of pooled earnings, and as a result the variability of managerial compensation is also reduced. This is essentially equivalent to narrowing the spread of the incentive compensation (difference in compensation between good and poor performance). This compensation smoothing effect, together with managerial risk aversion and

disutility for effort, weakens the manager's incentive to exert effort. This may drive shareholders (represented by the Board of Directors and its Compensation Committee) to change the compensation plan so as to better motivate the manager. Therefore, we would generally expect that the incentive portion of the management compensation package of acquiring firms increases after merger, relative to that before merger.

This general tendency is expected to be modified, however, when the effect of ownership structure is simultaneously considered. As discussed in Section 3.4, the effect of ownership structure (or a change in it) on the incentive portion is twofold. First, it interacts with the diversification effect and mitigates or accentuates it. Managerial incentive problems arising from the diversification effect will be largely mitigated for those firms which end up as owner-controlled firms after merger, while the opposite will be true for firms which end up as manager-controlled firms after merger. While the interaction effect deals with the <u>status</u> of the degree of ownership control after merger, the second effect of ownership structure works through the <u>change</u> in ownership structure from before to after merger. The change in ownership structure may change the monitoring ability of shareholders. If ownership structure changes toward the direction of manager control, the degree of monitoring would decrease, and this may drive the shareholders to rely more

on incentive schemes to reduce the agency problem. The opposite will be true if the change is toward more owner control. Thus, the change in the incentive portion of total compensation is expressed as a function of three factors: the diversification effect, the change in ownership structure, and the interaction effect between the status of ownership structure after merger and the diversification effect. This leads to the following hypothesis:

> Hypothesis 1: Ceteris paribus, the incentive portion of the management compensation package of the acquiring firm is expected to change after merger as a positive function of the diversification effect and a negative function of the change in the shareholders' monitoring ability. The diversification effect itself will be mitigated in proportion to the shareholders' monitoring ability after merger.

This hypothesis is tested using the following model:*

$$\Delta R_1 = b_0 + b_1 MERGER + b_2 OSCHANGE + b_3 MERGER*OS + b_4 EPSCH + e$$
$$\qquad\qquad (+) \qquad\quad (-) \qquad\quad (-) \qquad\quad (+)$$

where ΔR_1: Change in the incentive portion of the management compensation package from the year before to the year after merger.

MERGER: 1 for merger firms
0 for non-merger (control) firms.

OSCHANGE: Change in the degree of control by owners (ownership structure) from the year before to the year after merger.

OS: Ownership structure after merger.

EPSCH: Change in EPS (earnings per share) from the year before to the year after merger, standardized by EPS of the year before merger.

e: Random error.

(* Note: The signs within the parentheses under the coefficients designate expected directions for the effects of the respective independent variables).

Basically, the model explains the differential change in incentive-based compensation between merger and non-merger (control) samples for the period from the year before to the year after merger.[1] The change in ownership structure measures the change in the monitoring ability of shareholders, and the interaction term measures the degree to which the diversification effects are mitigated.

The change in EPS is added to the model in order to control for the effects of the firm's performance on management compensation. This adjustment is necessary because the hypothesis endeavors to explain the change in the structure of management compensation beyond that related to changes in the firm's performance. Since most of incentive contracts use earnings as a performance measure, a firm's performance is considered a positive function of EPSCH. Since this study examines the change in the structure of management compensation plans of acquiring firms, the EPS measure for the year before the merger pertains to the acquiring firm only, whereas it is for the combined firm for the year after merger. An alternative measure is discussed in Chapter V that also includes the earnings of the acquired firm for the year before the merger.

It is reasonable to expect that the magnitude of the change in incentive compensation would depend on the

magnitude of the incentive problems created by merger. Since the source of the agency problem is the decrease in firm return variance after merger (due to the pooling of uncorrelated or negatively related earnings of the two firms), the change in the incentive portion of managerial compensation would in turn depend on the magnitude of the decrease in firm return variance after merger, which is determined as follows.

$$\sigma^2_{AB} = w^2_A \sigma^2_A + w^2_B \sigma^2_B + 2 w_A w_B COV_{AB} \qquad (11)$$

where σ^2_{AB}: Variance of returns of the merged firm,

σ^2_A : Variance of returns of the acquiring firm,

σ^2_B : Variance of returns of the acquired firm,

w_A : Value of acquiring firm relative to that of merged firm,

w_B : Value of acquired firm relative to that of merged firm, and

COV_{AB} : Covariance of the merging firms.

Equation (11) indicates that firm return variance after merger is a function of the covariance between the cash flows of merging firms and the variance of each of the merging firms weighted by its relative value.

The firm return variance (of either an unmerged or a merged firm) is a function of the variances of stock and debt returns weighted by the square of [stock value/(stock value+debt value)] and the covariance of stock and debt returns. If there is no risky debt, the firm return variance would equal stock return variances weighted by their values. However, it is clear that the sample firms in

this study have risky debt outstanding and hence the use of only weighted stock return variances will be an understatement of the total firm return variance.

Also, in general, stock return variance is greater than bond return variance and the correlation between the two is imperfect. Thus, the stock return variance is an upper bound and the weighted stock return variance is a lower bound of total firm variance. As these bounds imply, the exact magnitude of the decrease in firm variance after merger can only be estimated. In this study, the magnitude of the decrease in variance is not computed, and only the directional change is predicted from the covariance of merging firms. This covariance is approximated by the purity of conglomerate merger. As will be further discussed in Chapter V, conglomerate mergers are classified into "product" and "pure" types. The former includes the mergers between firms in similar industries, whereas the latter is between firms in entirely different industries. Ceteris paribus, the covariance of pure type conglomerate mergers will be smaller than that of product type mergers, and hence the decrease in firm variance after merger is expected to be greater in the former case. This leads to the following finer partition (subsidiary hypothesis) of Hypothesis 1.

> Subhypothesis 1a: The change in the incentive portion predicted in Hypothesis 1 is expected to be the greater in pure than in product type mergers.

The firm size discussion in Equation (11) does not provide an unambiguous prediction for the change in firm

variance after merger. Intuitively, however, it is expected that the magnitude of the incentive problems would itself depend upon the size of the acquired firm relative to the acquiring firm. For example, the incentive effects of merger between firms with assets of $10 million and $5 million would be different from those for a merger between a $10 million firm and a $0.1 million firm. As an alternative partition to get at the magnitude of the compensation change observed, the following additional subsidiary hypothesis is tested.

> Subhypothesis 1b: The change in the incentive portion predicted in Hypothesis 1 is expected to be larger as the size of the acquired firm (relative to the acquiring firm) increases.

The above subsidiary hypotheses are tested using the same model and sample as that for Hypothesis 1 above.

4.2 Hypotheses Related to Shareholders' Response to Wealth Transfer

The discussion in Section 3.3 showed that in the absence of any mitigating effects, a variance decreasing (conglomerate) merger transfers wealth from shareholders to bondholders. This gives shareholders an incentive to take various actions to protect their wealth. The alternatives available to the shareholders discussed in Section 3.3 are i) to issue debt simultaneously with or subsequent to merger, and ii) to call or retire outstanding debt of the unmerged firm, and then issue new debt for the merged firm at a lower interest rate after merger, etc. However,

managers who are in control of the firm's financing and investment decisions will not engage in shareholder wealth protection measures unless such measures increase their welfare as well. Also, since control by the labor market is assumed to be imperfect, it is in the interest of shareholders to intervene by designing (or changing) the compensation plan in such a way that manager's welfare is more directly aligned with that of shareholders in order to help ensure that managers take the side of shareholders when bondholder-shareholder conflicts arise. This can best be accomplished by increasing the market (stock) based portion of managerial incentive compensation. The positive relationship between managers' stock holdings and shareholders' wealth is well documented in the literature (see Lewellen et al., 1984). Managers would have direct interest in the movement of stock prices if they have significant stock holdings. Generally, the more stock holdings the managers have, the greater would be the chance that managers take appropriate actions in the presence of wealth transfers.

Accounting-based compensation may also be used to motivate managers in a way that improves shareholders' wealth. However, since accounting-based incentive contracts are contingent on a firm's total operating cash flows (which also include cash flows to the bondholders), the use of accounting-based compensation will benefit bondholders as well. This makes accounting-based contracts

non-discriminating and hence less attractive to shareholders in a situation where bondholder-shareholder conflicts exist. Thus if a conglomerate merger creates wealth transfer from shareholders to bondholders as discussed in Section 3.3, we would expect that the market-based portion of incentive compensation of acquiring firms increases after merger to a greater extent than does the accounting-based portion.

As was the case for Hypothesis 1, however, this general prediction should be modified when we consider the effects of ownership structure. The effect of ownership structure (or change in it) is twofold for Hypothesis 2 also. First, the status of ownership structure after merger interacts with the magnitude of expected wealth transfer. Secondly, the change in ownership structure changes the monitoring ability of shareholders. If the change is from owner control to manager control, the monitoring ability of shareholders will decrease. As was discussed earlier, managers can take certain mitigating measures in order to protect shareholders' wealth from being transferred to bondholders (e.g., the issuance of debt after merger). The change in ownership structure to a manager-controlled firm would decrease shareholders' ability to ensure that managers take proper actions in the presence of potential wealth transfers to bondholders. This will induce shareholders to rely more heavily on the motivation scheme (market-based incentive compensation). Thus, the change in the market-based incentive portion after merger can be now expressed as

a function of wealth transfer, change in ownership structure and the interaction effect between the wealth transfer and the status of ownership structure after merger. This leads to the following hypothesis.

> Hypothesis 2: Ceteris paribus, the market-based portion of incentive compensation of acquiring firms is expected to change (relative to the accounting-based portion) after merger as a positive function of wealth transfer and a negative function of the change in the shareholders' monitoring ability. The wealth transfer effect will be mitigated in proportion to shareholders' monitoring ability after merger.

This hypothesis is tested using the following model:*

$$\Delta R_2 = b_0 + b_1 MERGER + b_2 OSCHANGE + b_3 MERGER*OS + b_4 EPSCH + e$$
$$(+) \qquad (-) \qquad (-) \qquad (?)$$

where ΔR_2: Change in the market based-incentive portion relative to accounting based incentive portion from the year before to the year after merger.

The other variables are the same as before and are defined in the previous section.

(*Note: The signs within the parentheses under the coefficient designate expected directions for the effects of the respective independent variables.)

The model is similar to that proposed for Hypothesis 1, except that the dependent variable is now the change in market-based incentive compensation (relative to accounting-based) and the expected sign for EPSCH is ambiguous. This is so because both the denominator and the numerator of ΔR_2 are functions of firm performance.

Hypothesis 1 predicted that the managerial incentive problem created by a conglomerate merger would lead to an increase in the incentive portion of total compensation after merger. Hypothesis 2 predicts that out of the total

incentive portion, the market-based portion will increase more than the accounting-based portion as a response to the wealth transfer. It should be noted that the accounting based incentive compensation is still considered an effective motivation tool. The point of Hypothesis 2 is that market based incentive contracts will be more effective in certain special circumstances where bondholder-shareholder conflicts exist.

As was the case for Hypothesis 1, the magnitude of the change in the market based portion is expected to be a function of the decrease in firm variance after merger, which is mainly a function of covariance between the merging firms. This prompts the following subsidiary hypothesis.

> Subhypothesis 2a: The change in the market-based incentive compensation (relative to accounting-based compensation) will be greater for pure type conglomerate mergers than for product type mergers.

However, the partition based on firm size (in the case of Hypothesis 1) needs to be reconsidered for Hypothesis 2. Since Hypothesis 2 is related to the wealth transfer from shareholders to bondholders, the magnitude of the wealth transfer will be a function of the size of debt, not the relative size of the acquired firm. For example, if no debt exists, the wealth transfer would not occur. This leads to the following subsidiary hypothesis.

> Subhypothesis 2b: The change in the market-based incentive compensation (relative to accounting-based incentive compensation) will be the greater the higher is the debt ratio of the merging firms in the year before merger.

In order to test this hypothesis, the total sample is partitioned according to the debt ratio (total debt/total assets) of the merging firms in the year before merger. The debt ratio is computed only for the year before merger because the magnitude of the wealth transfer is a function of the existing debt.

4.3 Hypotheses Related to the Decision Horizon Gap between Shareholders and Managers

In previous sections, the differences in the degree of monitoring modified the degree of underlying agency problems caused by other primary factors. In this section, the focus is on the decision horizon gap between the manager and the owner under alternative ownership structures.

The discussion in Section 3.4 suggests that, ceteris paribus, a manager's decision horizon tends to be short-term oriented if his performance is measured predominantly by short-term measures or his tenure with the firm is limited. However, since stock price is in general a function of the firm's future stream of residual cash flows, a decision horizon gap may arise between shareholders and managers under this situation (which has been documented to be typical in the U.S.). The obvious remedy to this potential agency problem is to increase the long-term portion of incentive compensation in order to narrow the decision horizon gap between shareholders and managers. This suggestion is supported by some prior evidence. Larcker (1983) found that the adoption of a long-term performance

plan is associated with a positive stock market reaction. Brickley, Bhagat, and Lease (1985) also found that shareholders' wealth increased with the announcement of various types of long-term managerial compensation plans.

However, the decision horizon gap may be widened or narrowed by the change in ownership structure caused by a merger. If the ownership structure is changed to manager control from owner control as a result of merger, the decision horizon gap will widen, and this in turn will drive shareholders to increase the long-term portion (relative to the short-term portion) of managerial compensation after merger, and vice versa if the change is to owner control from manager control.

A change in the long-term portion is also expected indirectly as a result of Hypotheses 1 and 2. Hypothesis 1 predicts a change in the incentive portion of total compensation and Hypothesis 2 predicts a change in the market-based incentive portion. The components of compensation common to the numerator of the dependent variables (ΔR_1 and ΔR_2) in Hypothesis 1 and 2 are long-term in nature while those common to the denominator are mostly short-term. This will change the ratio of long-term compensation relative to short-term in the same direction as predicted in Hypotheses 1 and 2. That is, a <u>simultaneous</u> increase in incentive portion and market based portion would in general increase the long-term portion of compensation

relative to the short-term portion. The above discussion leads to the following (supplementary) hypothesis.

> Hypothesis 3: Ceteris paribus, the long-term portion of management compensation of acquiring firms is expected to change after merger (relative to the short-term portion) as a positive function of the diversification effect, wealth transfer, and the degree of decision horizon gap between shareholders and managers.

Also, the following subsidiary hypotheses are posited as before.

> Subhypothesis 3a: The change in the long-term portion relative to the short-term portion will be greater for pure type than for product type mergers.
>
> Subhypothesis 3b: The change in the long-term portion relative to the short-term portion will increase as the size of the acquired firm relative to the acquiring firm increases.

These hypotheses are tested using a model similar to that employed for Hypotheses 1 and 2:*

$$\Delta R_3 = b_0 + b_1 MERGER + b_2 OSCHANGE + b_3 MERGER*OS + b_4 EPSCH + e$$
$$\qquad\quad (+) \qquad\quad (-) \qquad\quad (-) \qquad\quad (?)$$

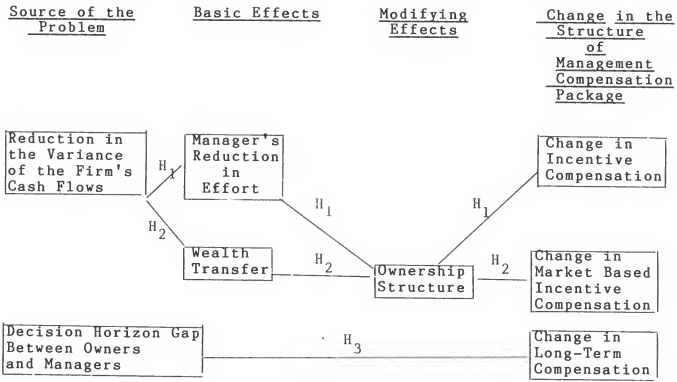
where ΔR_3: Change in long-term relative to short-term compensation from the year before to the year after merger.

The other variables were defined in previous sections.

(*Note: The signs within the parentheses designate expected directions for the effects of the respective independent variable.)

The sign for the merger variable is still expected to be positive because it is dependent on the results of Hypotheses 1 and 2 whose merger variables are predicted to be positive.

As a final synthesis, the broad theoretical linkages between the changes in firm characteristics brought about by a conglomerate merger, the resulting basic effects of managerial effort reduction and inter-claimant wealth transfer, the modifying effect of the degree of control by owners, and the expected response by the shareholders through changes in the structure of compensation are illustrated in Figure 4.1.



[a] H_1, H_2, H_3 represent Hypotheses 1,2 and 3, respectively.

Figure 4.1 Causal Links Between Changes in Firm Characteristics Precipitated by a Conglomerate Merger and Expected Changes in the Structure of Management Compensation

4.4 Note

1. Since the control firms do not have announcement dates, each control firm was assigned the same test period (the years before and after merger) as that of its matched merger counterpart.

CHAPTER V
RESEARCH METHODOLOGY

This chapter describes sample selection procedures and the experimental design used in the tests. The procedures used to measure/value each of the independent and dependent variables are also described in detail in this chapter.

5.1 Data Collection

The sample of merged firms was collected from Mergers and Acquisitions and the Federal Trade Commission's (FTC) Statistical Report on Mergers and Acquisitions (1980). The Statistical Report provides a list of all the mergers that occurred up to 1979 in which assets of the acquired firm were greater than $10 million. The Report classifies mergers into the following five types.

Type 1: horizontal mergers: between companies producing one or more of the same, or closely related, products.

Type 2: vertical mergers: between companies having a buyer-seller relationship before the merger.

Type 3: conglomerate mergers--product extension: when products of the acquiring and acquired companies are functionally related in production or distribution but do not compete with one other.

Type 4: conglomerate mergers--market extension: when the acquiring and acquired companies manufacture the same products but sell them in different geographic markets.

Type 5: pure conglomerate mergers: between firms that are functionally unrelated.

Types 3, 4 and 5 are conglomerate mergers. However, Type 4 mergers are not frequent and the merging firms typically belong to the same industry. As a result, only Type 3 and 5 mergers were used as initial samples in this study. Type 5 mergers are generally mergers between firms in entirely different industries. These are the "pure" type of conglomerate mergers, whereas Type 3 mergers are between firms in somewhat similar (but different) industries and thus are "less pure" forms of conglomerate mergers. Since the Report was discontinued after 1979 data had been compiled, sample firms after 1979 were selected from Mergers and Acquisitions. Mergers and Acquisitions provide information such as the value, the type of industry of merging firms before merger, effective date of merger, the amount of consideration paid, etc. These mergers were classified into Type 3 and Type 5 following FTC's classification. The announcement dates of mergers were obtained from the Wall Street Journal Index. The year of merger was determined based on the announcement date. The announcement date was selected as the relevant date because any economic/decision changes in connection with the merger are expected to take place around this date. Also, this is the date used as the event date in most of the merger related stock market studies. The test period in this study comprises the year before ($t = -1$) and the year after merger

(t= +1). Table 5.1 shows the distribution of industry, announcement year and merger types for the 96 sample firms (47 merger and 49 non-merger control firms) that were actually used in the test. There are 25 Type 3 mergers and 22 Type 5 mergers with announcement year ranging from 1976 to 1983.

A sample of control firms was randomly selected from the Compustat Manual and pair-matched with the merger firms on the basis of the SIC code (two digits).[1] Since control firms are non-merger firms, the same merger type and announcement year was assigned to the control firms as those of corresponding merger firms. Care was taken to ensure that control sample firms did not have any merger activity during the test periods.

Compensation data for the sample firms were obtained from the proxy statements.[2] Proxy statements that were not available at the University of Florida Library were obtained from the Securities and Exchange Commission in Washington, D.C. Since this study requires, among other things, i) separate salary and bonus data, and ii) availability of stock option data for the test period, final samples consist of Type 3 and 5 conglomerate mergers whose proxy statements disclose salary and bonus data separately, and provide information that can determine stock option data for the test period. These relatively stringent data requirements contribute to the small sample size of 96 firms.

Table 5.1
Industry and Announcement Year Distribution for
Samples of Merger and Control (Non-Merger) Firms

Industry Distribution

Industry Number	Merger Firms	Non-Merger Firms
0 - 999	0	0
1000 - 1999	0	1
2000 - 2999	20	18
3000 - 3999	21	23
4000 - 4999	3	3
5000 - 5999	2	3
6000 - 7999	0	0
8000 - 8999	1	1
Total	47	49

Announcement Year

Announcement Year	Merger Firms	Non-Merger Firms
1976	3	3
1977	0	0
1978	5	5
1979	9	8
1980	10	12
1981	3	3
1982	10	12
1983	7	6
Total	47	49

Merger Types

Merger Type	Merger Firms	Matched Non-Merger Firms
Type 3	25	28
Type 5	22	21
Total	47	49

5.2 Experimental Design

The hypotheses developed in Chapter IV involve comparisons between merger and non-merger firms with certain other variables controlled. As mentioned in the previous section, control firms were pair-matched on the basis of industry number and test period. This was done in an attempt to control for the change in the structure of management compensation due to economy- or industry-wide factors.

The statistical analysis was performed using univariate and multivariate tests. Univariate tests were used to compare dependent variables between merger and non-merger firms. Both parametric and non-parametric (Wilcoxon Rank Sum) procedures were used. The latter test is distribution-free and as powerful as the t-test in large sample sizes. Next, a multiple regressions test was applied separately to the models developed in Chapter IV. Finally, a comprehensive multiple analysis of variance (MANOVA) was used to evaluate the different hypotheses simultaneously.

Each hypothesis was tested using alteratively, i) the complete set of components of compensation plans examined in this study (salary, bonuses, stock options, performance unit, performance shares, restricted stock, phantom stock, dividends units, and stock bonuses), and ii) a subset comprising the more common forms of compensation plans (salary, bonuses and stock options). The former test is

referred to as the "full test" and the latter as the "short-form" test. Also, the tests were separately performed using the total sample and certain partitions of the sample. The sample partitions were based on i) the purity of conglomerate merger (merger type), ii) the size of the acquired firm relative to that of the acquiring firm (for Hypotheses 1 and 3), and iii) debt ratio of the merging firms (for Hypothesis 2). All of these tests were performed separately for the chief executive officer (CEO) alone and for the top three executives as a group.

Figure 5.1 categorizes all the above alternate forms of tests that were performed.

5.3 Dependent Variable Measurement

The dependent variables used in this study capture compensation structure as ratios of various compensation components--salary, bonuses, stock options, performance units(shares), restricted stock (phantom stock), dividend units, and stock bonuses. As discussed in Chapter IV, changes in these ratios are interpreted as an indication of the shareholders' response to the managerial agency problems. The dependent variables employed are the change in the incentive portion of total compensation (ΔR_1), the change in the market-based to accounting based incentive compensation (ΔR_2), and the change in the long-term portion relative to the short-term portion (ΔR_3). Table 5.2 shows the formulas used to compute each of the compensation

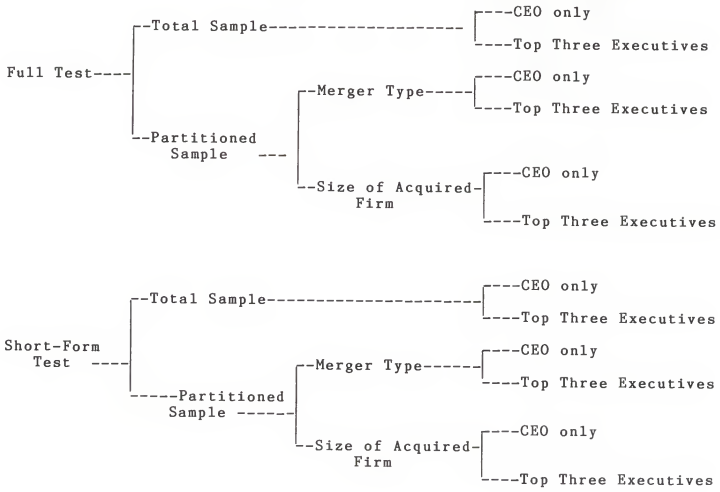


Figure 5.1
Categories of Alternative Tests Performed

Table 5.2
Computation Formulas For Dependent Variables[a]

Variable[b]	Short-Form Test	Full Test
R_1	$\frac{B + SO}{S + B + SO}$	$\frac{B + SO + PU + PS + RS + FS + DU + SB}{\text{Total Compensation}}$
R_2	$\frac{SO}{B}$	$\frac{SO + PS + RS + FS + SB}{B + PU}$
R_3	$\frac{SO}{S + B}$	$\frac{SO + PS + PU + RS + FS}{S + B}$

a The abbreviations are defined below:

S: Annual Salary
B: Annual Bonus
SO: Stock Options
PU: Performance Units
PS: Performance Shares
RS: Restricted Stocks
FS: Phantom Stock
SB: Stock Bonus
DU: Dividends Units

b The ratios signify the following:

R_1 =The incentive portion of the total compensation.

R_2 =Market based incentive compensation divided by accounting based incentive compensation.

R_3 = Long-term compensation divided by short-term compensation.

Note that dependent variables are the change in each of the above ratios from the year before to the year after merger (after minus before).

ratios. Measurement procedures for each compensation component are further detailed below.

5.3.1 Salary and Bonuses

In the majority of the cases examined in this study, the proxy statement shows the compensation paid as salary and bonuses as a combined total. A few companies, however, do disclose salary and bonus data separately. In some cases (where only the total of salary and bonuses is available), a separation of salary and bonuses amounts can be obtained through the employment contract provided on the proxy statement. Only those firms whose salary and bonus data are separately determinable (in any manner) were used in this study. In general, relatively large companies disclose more detailed information than small companies. The sample size was significantly reduced because the companies which disclose salary and bonus data separately in a certain year do not necessarily furnish such separate information in adjoining years. These data were collected for CEO only and for the top three executives together.

5.3.2 Stock Options

Two types of stock option data are available from the proxy statement--the options granted and options outstanding. Outstanding options are those granted in the previous and current years but not exercised yet. These are the result of shareholders' past (including current year) granting decisions. Those awarded in the current year (only) measure shareholders' compensation decisions in the

current year. Since this study examines the change in the shareholders' compensation decisions between the year before and the year after merger, only the options awarded in the current year are the appropriate measure for this study.

The number of options granted in the current period only is not always available on the proxy statement. The proxy statement discloses the number of options granted, exercise price, the number of options outstanding as of the reporting date and their potential realizable value. However, reporting periods may be one of the following:

i) For the current year only.

ii) For 13- to 15-month periods from the beginning of the current year to the proxy statement report date.

iii) For the total five-year period including the current year.

In the first case, there is no measurement problem. In the second case, the option data for the years before and after merger are extended one to three months into the next year. Since the dependent variable is a change in ratios, this would not create a significant problem if the year before and after merger were reported in a consistent manner. A problem arises, however, if the option data for the year before merger are reported for a 14-month period, for example, and announcement date of the merger is either January or February. In this case, some portion of options that are reported as having been granted during the year

before merger may have been actually granted after the announcement date of the merger. This will make the option data misleading. In general, this problem is not considered serious because the problem arises only for the merger firms which report option data for 13- to 15-month period and whose announcement date is in the early part of the year. Even in this case, the problem arises with respect to the portion actually granted, if any, after announcement date and before proxy statement report date.

In the third case, options granted during the current period cannot be directly determined. In some cases, options granted during the current period could be identified (but only by chance) using such information as year of employment, market price of the stocks, changes in outstanding number of options between two adjacent years, etc. In most other cases where currently awarded portion of the 5-year total is not determinable, the following example illustrates the procedure used to estimate the number of options granted in the current period.

The proxy statement (March, 1984) of Rockwell International Inc. discloses options granted for the five-year period (1979-1983) as follows.

Executive	Number of Options*	Exercise Price
A	77400	$ 19.53
B	50830	19.34
C	29800	19.03

(*Adjusted for 2:1 stock split during 1983 and 1980.)

These options were allocated to 1983 (for example) using the following procedure. The annual report discloses the number of stock options granted each year (for the company as a whole) and the related exercise prices. The following data were obtained from the annual report of the company for the same period.

Year	Options Granted*	Exercise Price
1979	1,039,200	$ 10.30
1980	298,000	4.00
1981	392,800	
1982	554,800	
1983	1,097,400	$ 25.70
Total	3,382,200	

(*Adjusted for 2:1 stock split in 1983 and 1980.)

Percentage of stock options granted in 1983 is computed as follows using the above information.

Percentage granted in 1983:
(1,097,400/3,382,200) X 100=32.44 %

Options granted during 1983 for each of the executives are allocated as follows:

Executive A : 77400 X 0.3244 = 25108
Executive B : 50830 X 0.3244 = 16489
Executive C : 29800 X 0.3244 = 9667

Approximately 20 percent of the option data was estimated using the above estimation procedure.

A valuation problem still remains for the options measured (or estimated) as above. The following two valuation procedures were considered.

i) The option pricing model (Black-Scholes model or some variation of it).

ii) Potential realizable value: (market price of the stock at fiscal year end-exercise price) x number of options granted during the year

The second approach was used in this study because of the following reasons.

i) The option pricing model assumes that the option is marketable. However, executive stock options have somewhat distinct characteristics from marketable stock options (non-transferability, employment restrictions, short-selling prohibitions, etc).

ii) Basically, the option pricing model computes the value of the future stock price in excess of exercise price, if any, discounted by the term of the option under certain distributional assumptions of stock prices. Since the duration of the executive stock options is generally long-term (5 or 10 years), the model does not compute the amount of option value attributable to the current year only. This would make the option value non-comparable with salary and bonus data which represent annual amounts.

Many companies award stock options in tandem with stock appreciation rights (SAR). SARs are different from stock options in that cash is paid for the appreciation of stock price in excess of exercise price. In this study, no distinction was made in valuation between an SAR and a stock option because the difference in the means of payment is not

considered important.

5.3.3 Performance Units (Shares)

Performance units are awarded at the beginning of three- to six-year performance periods and actual payment is made after achievement of the performance standard established at the beginning of the award period. Typical performance measures include EPS (earnings per share), return on investment, return on asset, or some combination thereof. As in the case of stock options, the amount of compensation from the performance shares (units) relevant to the shareholders' current compensation decision will be that awarded in the current year only. However, since this award applies to the entire performance period, only the portion attributable to the current year is the relevant compensation measure that is comparable to annual salary and bonus. This can be computed by dividing the actual cash payments for the current awards (which are made at the end of the performance period) by the number of performance periods. However, in most of the cases, this ex post amount was difficult to identify and trace to the related period. Thus, the measure used in this study is the amount of accounting accruals disclosed on the proxy statement as a current income equivalent of performance shares (units). Table 5.3 illustrates the typical procedures used to determine compensation from performance shares.[3]

Use of accounting accruals as a current portion of long-term compensation, however, raises the following

Table 5.3
Computation of the Compensation from Performance Shares

Compensation from Performance Shares

i) Performance Standard--EPS at the end of award period

	Portion of Shares Earned
$ 5.00	100 %
4.75	66 %
4.50	33 %
Less than 4.50	0 %

ii) Performance Periods : 3 years

iii) Number of Shares Awarded at the Beginning of the Period.

Executive A	5000 Shares
Executive B	4000 Shares
Executive C	3000 Shares

iv) EPS at the end of the performance period is assumed to be higher than $ 5. Market prices at the end of each period are assumed to be $ 12, $17 and $16, respectively.

Accounting Accruals (for Executive A only)

	Year 0	Year 1	Year 2
Base Price	$ 0	$ 0	$ 0
Market Price at Year End	12	17	16
Spread per Share	12	17	16
Shares Awarded	5000 Shares		
Potential Realizable Value	$ 60000	$ 85000	$ 80000
Percent Accrued	33.3%	66.6%	100%
Cumulative Compensation	$ 20000	$ 56667	$ 80000
Amount Previously Recognized	0	$ 20000	$ 56667
Accruals for the Year	$ 20000	$ 36667	$ 23333

potential problems.

i) If both the year before and the year after merger fall within the same performance period, the change in the shareholders' compensation decision during the period cannot be measured by examining the accounting accruals in the particular year. In this case, the difference in accruals between the year before and the year after merger will be due only to the change in the firm's performance.

ii) Accounting accruals may be influenced by the market price of the stock at a particular point in time.

The first potential problem did not become an actual problem because in most of the cases at least some portion of the accounting accruals in the year after merger represent different granting decisions of shareholders from those of the year before merger. Bickford (1981) reported that out of 82 firms examined, 60 percent of the firms granted performance shares (units) annually and 32 percent biannually. This means that since the years before and after merger are two years apart, at least some portion of accounting accruals in the year after merger must be attributable to a change in granting decisions since the year before merger. Therefore, the comparison of accounting accruals for the two periods is meaningful. The second problem will make the compensation change subject to the effects of the change in the firm's performance to some extent. These effects are controlled for explicitly by

using EPS as a control variable in the model tested. Besides the above potential measurement problems, performance shares have a classification problem. The typical performance measure for performance shares (EPS) is accounting-based, while the means of payment (stock) is market-based. This makes characteristics of the performance plan partly accounting-based and partly market-based. In this study, it was treated as market-based. The effects of potential misclassification are expected to be insignificant because only 20 percent of sample firms have performance shares. The alternative short-form tests, which use only salary, bonus and stock options, are free from the effects of this potential misclassification problem.

5.3.4 Restricted Stock and Phantom Stock

The measurement of restricted stock (phantom stock) raises problems similar to those discussed in the previous section. Typically, the only restriction imposed on the executives in connection with the award of restricted stock is continued employment with the firm for certain periods. The amount of compensation from the restricted stock (phantom stock) for a particular year would then be the number of shares awarded in the current period multiplied by the stock price at the end of the award period, divided by the number of award periods. As discussed in the previous section, however, proxy statements in most of the cases disclose only accounting accruals for the current year, computed in the same manner as performance shares. This

amount was used as compensation for restricted stock for the current year.

Phantom stock is different from restricted stock only in that the compensation is paid in the form of cash for the appreciation of stock price above the base price (if any). Therefore, these are measured and valued in the same manner as restricted stock.

5.4 Independent Variable Measurement

The independent variables used in this study are MERGER (a classification variable that classifies merger and non-merger firms), OSCHANGE (change in ownership structure from the year before to the year after merger), the interaction effect between MERGER and OS (the status of ownership structure after merger), and EPSCH (change in earnings per share from the year before to the year after merger). The measurement of the MERGER variable is obvious. The procedures used to measure the rest of the variables are detailed below.

5.4.1 Ownership Structure Related Variables

As discussed in Section 3.4, the managerial agency problems arising from diversification and wealth transfer are influenced by the shareholders' potential monitoring ability. Since the monitoring ability is not observable, the degree of owner control (ownership structure) is used as a proxy for the shareholders' monitoring ability. This variable has been widely used in the studies in this area.

The status (at a point in time) of ownership structure is measured as a percentage of stock holdings held by the principal stockholders (defined as those who hold more than 5 percent of total outstanding shares at a certain point in time). OS stands for the status of ownership structure after merger, while OSCHANGE is the change in this status from the year before to the year after merger. Initially, the ownership structure was measured by the sum of stock holdings by all the principal stockholders. Proxy statements disclose the name and stock holdings by all principal stockholders with more than five percent of ownership interests. This measure, however, has the following potential problems.

i) It also includes stock holdings by the institutional investors. Generally, the duration of their stock holdings is short and the main purpose of the investment is income, not control. Since stock holdings are used as a proxy for the monitoring ability by the owners of a firm, institutional holdings may not serve this purpose.

ii) Proxy statements only disclose stock holdings by the principal stockholders with more than 5 percent ownership interests. If none of the stock holders have more than 5 percent, the stock holdings by the owners are arbitrarily assigned 2.5 percent. Stockholders with less than 5 percent, but possibly with a significant ownership interest

(for example, 4 percent), are not disclosed on the proxy statement. If there are many such stockholders, measurement of monitoring ability will be somewhat misleading.

The first problem can be solved by measuring the OS variable as stock holdings net of institutional holdings. There is no direct remedy for the second problem. However, in order to see the effects of alternate measurement, a dichotomous rather than continuous scale was also used to measure ownership structure.

5.4.2 Change in Earnings Per Share

This variable, EPSCH, is measured as the change in EPS from the year before to the year after merger, standardized by the absolute value of EPS in the year before merger. The absolute value was used to prevent further reduction in the sample size due to possible negative denominators. In case of merger firms, EPS in the year before merger pertains to the acquiring firm only. The EPSCH variable measures the change in the firm's performance (as represented by accounting profit) from the year before to the year after merger (after minus before). Since incentive compensation is a direct (or indirect) function of the firm's performance, the difference in the dependent variable between experimental and control samples may arise due to the differential change in the performance during the test period in addition to the differential change in the firm characteristics that result from a merger. Hence, the

change in EPS over the test period was used to control for the effect of firm's performance on management compensation.

As mentioned above, EPS for the year before merger pertained to the acquiring firm only. The EPS of the acquired firm in the year before merger was ignored because this study focuses on the change in the management compensation of the acquiring firm only. However, the EPS of acquiring firm in the year before merger and that of combined firm in the year after merger may not be comparable to the extent that the shares (if any) exchanged to consummate the mergers may not be perceived to reflect the same earnings generating ability as that of the acquiring firm. In order to overcome this possible dilution effect on the earnings of the acquiring firm, the absolute amount of net income was also used (as an alternative measure) to control for the effect of the change in firm's performance on the change in incentive portion of total compensation, as follows:*

$$NICH = \frac{NI(AB)_{t=+1} - [NI(A)_{t=-1} + NI(B)_{t=-1}]}{Abs\ [NI(A)_{t=-1} + NI(B)_{t=-1}]}$$

where NICH: The change in net income from the year before to the year after merger.

$NI(AB)_{t=+1}$: Net income of the combined firm in the year after merger.

$NI(A)_{t=-1}$: Net income of the acquiring firm in the year before merger.

$NI(B)_{t=-1}$: Net income of the acquired firm in the year before merger.

(*Note: Abs represents absolute value. Absolute value was used in order to prevent reduction in sample size).

5.5 Notes

1. Because of the difficulty in finding sample firms given the various data constraints, 7 pairs were matched using 1 digit.

2. Compensation data for merger firms were obtained for acquiring firms only. This was done mainly because of data limitations. The theories presented in Chapter III apply equally to the acquired firms as well.

3. Accrual procedures for performance units are similar to performance shares.

CHAPTER VI
EMPIRICAL ANALYSIS

This chapter presents the results of the empirical tests. Descriptive statistics related to the basic data that were subsequently transformed into dependent and independent variables are reported in Section 6.1, while the discussion of test results follows in Section 6.2.

6.1 Descriptive Statistics

Table 6.1 presents the mean, standard deviation and sample size for i) individual compensation components (Panel A), ii) the ratios used to compute the dependent variables (Panel B), and iii) other independent variable statistics (Panel C). The information is provided for the year before and the year after merger, separately. Compensation from restricted stock, performance shares and phantom stock are combined into one category because they are all long-term market-based incentive compensation.

Salaries generally increased during the test period for both merger and control firms, while performance based incentive compensation generally decreased for control firms. This is reasonable because salary is generally based on macro variables (e.g., inflation rate, etc), while

Table 6.1
Selected Summary Statistics
(Full Test--Top Three Executives)[a]

Variables		All Firms		Merger Firms		Non-Merger(Control) Firms	
		Before	After	Before	After	Before	After
				Panel A			
Salary	mean	229M	274M	218M	265M	239M	281M
	s.d.	110M	128M	101M	119M	118M	135M
	n	96	96	47	47	49	49
Bonus	mean	117M	135M	112M	164M	120M	110M
	s.d.	130M	126M	95M	138M	156M	110M
	n	96	96	47	47	49	49
Stock options	mean	51M (19M)[b]	26M (22M)[b]	13M	45M	87M (25M)[b]	10M (20M)[b]
	s.d.	228M (46M)[b]	79M (87M)[b]	29M	108M	314M (57M)[b]	24M (68M)[b]
	n	96	96	47	47	49	49
Performance units	mean	93M	60M	41M	25M	126M	84M
	s.d.	122M	90M	63M	37M	141M	104M
	n	14	15	6	6	8	9
(Restricted Stock	mean	125M	177M	99M	289M	149M	74M
+Performance share	s.d.	142M	311M	77M	410M	185M	118M
+Phantom stock)	n	28	27	14	13	14	14

Table 6.1
(Continued)

Variables		All Firms		Merger Firms		Non-Merger(Control) Firms	
		Before	After	Before	After	Before	After
Other (Stock bonus+Dividend units)	mean	38M	66M	22M	65M	56M	68M
	s.d.	34M	120M	17M	125M	54M	66M
	n	9	9	5	5	4	4
				Panel B			
R_1 Incentive / Total	mean	0.39	0.36	0.39	0.44	0.39	0.30
	s.d.	0.21	0.19	0.18	0.17	0.24	0.19
	n	96	96	47	47	49	49
R_2 Market Based / Accounting Based	mean	0.76 (0.52)[b]	0.65 (0.59)[b]	0.57	0.80	0.99 (0.45)[b]	0.25 (0.30)[b]
	s.d.	1.45 (0.92)[b]	1.06 (1.09)[b]	1.02	1.32	1.81 (0.76)[b]	0.52 (0.61)[b]
	n	79	85	42	46	37	39
R_3 Long-Term / Short-Term	mean	0.31 (0.19)[b]	0.21 (0.22)[b]	0.18	0.29	0.42 (0.20)[b]	0.13 (0.13)[b]
	s.d.	0.63 (0.31)[b]	0.37 (0.37)[b]	0.30	0.45	0.82 (0.31)[b]	0.27 (0.24)[b]
	n	96	96	47	47	49	49

Table 6.1
(Continued)

Variables		All Firms		Merger Firms		Non-Merger(Control) Firms	
		Before	After	Before	After	Before	After
				Panel C			
Ownership Interest (%)							
Total Holdings	mean	19.0	21.0	19.6	20.7	18.5	21.6
	s.d.	21.0	22.0	22.4	22.3	19.7	21.7
	n	96	96	47	47	49	49
Net Holdings	mean	13.5	13.6	13.0	12.0	14.0	15.0
	s.d	19.6	19.9	19.1	19.1	20.3	20.8
	n	96	96	47	47	49	49
EPS	mean	3.39	3.01	3.82	3.62	2.98	2.42
	s.d	5.19	3.28	2.13	2.29	6.19	3.94
	n	96	96	47	47	49	49
Size	mean	3195MM	3987MM	1900MM	2951MM	4385MM	4982MM
Debt Ratio[c] (Debt/Total Assets)	mean	0.20	.	0.19	.	0.22	.

[a] The summary statistics are for the year before merger (before) and year after merger (after). Labels "s.d." and "n" represent standard deviation and sample size, respectively. All monetary variables, except for EPS, are in thousands ($M) or in millions ($MM).

[b] The numbers in parentheses represent those computed after 5 extreme values were eliminated (see explanation on page 93).

[c] The debt ratio in the year after merger was not used in the test and thus not computed. Also, the debt ratio for the merger firms pertains to two combining entities combined.

incentive compensation is a direct (or indirect) function of firm performance. The performance of the control firms (measured in EPS) significantly decreased during the test period (by -56 cents per share). In contrast, merger firms generally experienced a significant increase in bonus and market-based incentive compensation despite a decrease in the firm's performance. The variability of market-based compensation is greater than that of salary and accounting based compensation. Stock options have the highest variability and salaries have the lowest. The coefficient of variation (standard deviation divided by mean) is the highest for stock options, followed by restricted stock (including performance shares and phantom stock), performance units, bonuses, and lastly by salaries. The high variability of stock options may have been caused by wide variations in stock prices among the sample firms. The magnitude of salary and bonus data are in general not much different from those reported in the literature.[1] Stock option data are difficult to compare between studies because of the differences in measurement and valuation procedures employed. Some studies measure only currently awarded options, while others measure the total number of stock options outstanding at a particular point in time. Options are valued in different ways as well. Some studies value stock options using an option pricing model, whereas potential realizable value (difference between market and exercise price) is used in other studies. This study

measures only the currently awarded portion of stock options, which is then multiplied by potential realizable value at fiscal year end to compute compensation from stock options. Thus, stock options have value only to the extent that the market price per share rises above the exercise price since the date of grant (which is in the current year). Also, approximately 25 percent of the sample firms (in this study) did not grant stock options in a particular year. This may explain the small magnitude of stock option value as well as its high variability.

Each compensation component as a percentage of total compensations (weighted by the number of observations) is approximately 53 % for salary, 21 % for bonus, and 26 % for other long-term compensations (including stock options). These ratios are comparable to those reported in the Wall Street Journal of February 28, 1986 (see note 1).

Compensation ratios R_2 and R_3 for the control firms in the year before merger are unusually high. This was caused by some extreme values. Since the dependent variable is the change in the ratio, a high ratio in a certain year does not by itself create a problem unless it leads to extreme dependent variable values. As is further detailed later (p.93), an additional test was run with these extreme values eliminated in order to determine the effect of these extreme values on the results. The ratios computed with the extreme values eliminated (reported in the parentheses below each

ratio) are not much different from those for the merger firms (in the year before merger).

Table 6.2 presents the Spearman correlation matrix for the variables used in the test. Although no serious multicollinearity problem among the independent variables is noted, the dependent variables ΔR_2 and ΔR_3 are highly correlated. This was caused because there is a similarity between the numerators and the denominators of each ratio. Due to this and other considerations discussed later, a MANOVA procedure was used using all the dependent variables as a vector.

6.2 Discussion of Results

The results for the CEO only are similar to those for the top three executives in most respects. Also, the univariate tests do not show any significant differences from the multivariate tests. Since this study focuses on top management compensation design from a company-wide policy perspective, only the results of multivariate tests for the top three executives (both full and short-form tests) are reported in this chapter, and those of the univariate tests are reported in the Appendix. The results are presented below for each of the sample groups in the order of the hypotheses (Refer to Figure 5.1 for the categories of alternate tests performed).

6.2.1 Hypothesis 1

Hypothesis 1 suggests that the incentive portion of

Table 6.2
Correlation Matrix for the Total (Merger and Non-Merger) Sample[a]

	ΔR_1	ΔR_2	ΔR_3	Merger	OSCHANGE	MERGER*OS	EPSCH
ΔR_1	1.00 (0)	0.56 (0.0001)	0.70 (0.0001)	0.31 (0.002)	-0.11 (0.27)	0.13 (0.21)	0.35 (0.002)
ΔR_2		1.00 (0)	0.90 (0.0001)	0.34 (0.003)	-0.07 (0.56)	0.02 (0.83)	0.09 (0.44)
ΔR_3			1.00 (0)	0.33 (0.001)	-0.09 (0.39)	0.09 (0.40)	0.18 (0.08)
MERGER				1.00 (0)	-0.13 (0.20)	0.42 (0.0001)	0.03 (0.78)
OSCHANGE					1.00 (0)	-0.03 (0.77)	0.03 (0.74)
MERGER*OS						1.00 (0)	0.001 (0.98)
EPSCH							1.00 (0)

[a] The table shows Spearman correlation coefficients and related significance levels in parentheses.

total compensation would change in response to the managerial agency problem (potential reduction in managerial effort). The change was hypothesized as a positive function of the diversification effect and negative functions of shareholders' monitoring ability and interaction effect. Since the test was conducted on the total sample and partitioned sample separately, the results are reported separately.

6.2.1.1 Total Sample

Table 6.3 reports the results of multiple regressions for the total 96 sample firms (47 merger and 49 non-merger firms). The expected signs for the coefficient of each independent variable are shown in the top row. The explanatory power of the model is reasonable (R^2=0.23). Also, the results of short-form test are similar to those of the full test.

The sign for the merger variable is expected to be positive because the variable is set equal to 1 for merger firms and 0 for non-merger (control) firms. This variable is significant at the 1 percent significance level with a positive sign as expected, implying that the compensation structure shifts in the direction of increasing the incentive component as a result of a conglomerate merger.

The sign for the change in ownership structure (OSCHANGE) is expected to be negative because the more stock holdings the principal owners have, the greater the potential monitoring ability of the owners is likely to be.

Table 6.3
Multiple Regressions For Hypothesis 1--Total Sample[a]
(N=96)

Expected Sign		+	-	-	+	
ΔR_1[b] =	b_0 +	b_1MERGER +	b_2OSCHANGE +	b_3MERGER*OS +	b_4EPSCH	R^2
Full Test	-0.091** (-2.89)	+0.141** (2.85)	-0.003 (-0.95)	+0.00004 (0.02)	+0.085** (3.77)	0.23
Short-Form Test	-0.087** (-2.94)	+0.133** (2.83)	-0.002 (-0.66)	+0.005 (0.29)	+0.081** (3.81)	0.23

a Numbers in parentheses are t-statistics

b ΔR_1 = Change in the incentive portion of the total compensation from the year before to the year after merger.

* Significant at 5 % significance level (one tail test).

** Significant at 1 % significance level (one tail test).

This will reduce the need by the owners to use incentive compensation as a motivation tool to induce appropriate effort from the managers. Thus, the change in the incentive portion of compensation (ΔR_1) is expected to be negatively related to the change in stock holdings by the owners. As indicated in Section 5.4, this independent variable was measured in three alternative ways--total stock holdings (relative to outstanding shares), net stock holdings exclusive of institutional stock holdings, and dichotomous measurement. The results using net stock holdings (relative to outstanding shares) are reported in this chapter and those for total stock holdings and dichotomous measurement are reported in the Tables A.2 and A.3 in Appendix. All the results are similar to each other. In most of the cases, this variable, while it has right sign, is not significant at the conventional level. This results suggests the following possibilities:

i) The change in the owner's monitoring ability is not related to the change in the structure of management compensation. Or, the structure of management incentive compensation is not sensitive to the change in the owner's monitoring ability measured as stock holdings by the principal stockholders.

ii) The change in ownership structure in the test period is not significant enough to be detected by the statistical model employed.

iii) Stock holdings are not a good proxy for the owner's monitoring ability.

iv) Measurement errors, as discussed in the previous section, is significant.

v) The regression model posits a linear relationship between the change in incentive portion and change in stock holdings. The relationship between the two variables may not be linear.

The possible non-linearity of the relationship does not seem to be a serious problem because little improvement was made by the use of a dichotomous measurement for this variable. Rather, interpretations i) and ii) seem more reasonable in consideration of the summary statistics presented in Table 6.1. The mean change of principal shareholders over the test period is not significant for the sample firms used in the study. Although some of the merger firms experienced significant dilution of ownership interest after merger, the mean change is only -1 percent for merger firms (both in total and net stock holdings) and +1 percent for non-merger firms(+4 percent in total stock holdings). To this extent, the second explanation above may be more probable. However, it may still be true that the change in the structures of management compensation may not be as sensitive to the change in ownership structure [explanation i) above]. In the absence of an accurate measure of shareholders' monitoring ability, and sufficient change in stock holdings during the test period, it is difficult to

draw a definitive conclusion. This result, however, does not necessarily deny the relationship between the ownership structure and the structure of management compensation. The relationship may exist cross-sectionally across firms at a certain point in time. The use of a dichotomous ownership variable reduces the sensitivity problem to some extent. However, the problem still remains because there is no theoretical justification for the critical value used to dichotomize the variable, and in the vicinity of the critical value, a slight change in the stock holdings changes the variable to another classification. In this case, the sensitivity problem still remains.

Another potential problem with the ownership control related variables is an assignment of arbitrary percentage (2.5 percent) in case none of the owners hold more than 5 percent ownership interest. Thus, if none of the stockholders hold more than 5 percent both in the year before and after merger, OSCHANGE will take the value of zero. These observations will be clustered around the fixed number zero. Since this is not expected to create a serious econometric problem, the use of a continuous variable is considered superior to the use of a dichotomous variable.

The expected sign for the interaction effect (MERGER*OS) is negative. The interaction term allows mitigation or accentuation of the managerial agency problem created by a conglomerate merger. Therefore, the interaction effect arises only for merger firms. For those

firms in which none of the owners have significant ownership control, a managerial agency problem created by a conglomerate merger will be accentuated because of owner's inability to monitor managerial actions, whereas this will be mitigated for those firms whose owners have significant ownership control and thus potential monitoring ability. The extreme case is the single owner-manager firm where the owner himself is also a manager. Thus, the interaction effect will be a negative function of stock holdings by owners. This variable was found to be statistically insignificant and the sign is positive. The same explanations as those for the ownership structure status apply to the interaction term.

The sign for the change in EPS is predicted to be positive because the change in the incentive portion is a (direct or indirect) function of the change in firm's performance over the test period. This variable is significant and the sign is positive, as expected. The association between the firm's performance and the level of compensation has been documented by Murphy (1983). This study indicates that the association holds for the ratio of incentive portion to total compensation. This finding is important in that the central hypothesis of this study attempts to explain the change in the management incentive compensation after allowing for the effects of the change in the firm's performance, among other reasons. However, no attempt is made to establish (or explain) a causal link

between the firm's performance (measured by accounting profits) and executive compensation. The EPS change variable simply attempts to statistically remove the effect of the change in accounting profit on management compensation. The results indicate that the statistical control was effective for the particular set of sample firms used in this paper.[2]

Further, as discussed in Section 5.4.2, the change in net income (NICH) of the merging entities combined was also used as an alternative measure to control for the change in the firm's performance. This measure was used in order to overcome the potential dilution effects on the (accounting) earnings of the acquiring firm (because the exchange ratio of the shares of the merging firms is based on the market value of each firm). Thus, the EPS of the combined firm after merger may not be comparable to that of the acquiring firm before merger. The results are reported in Table A.4 in Appendix. MERGER variable is still significant, and, as predicted, NICH variable is significant for Hypothesis 1, but not for Hypotheses 2 and 3. This indicates that the use of the alternative NICH variable leads to results that are qualitatively very similar to those obtained with the EPSCH variable. The Pearson correlation between EPSCH and NICH is a high 0.65 ($p < 0.0001$).

6.2.1.2 Partitioned Samples

Subhypothesis 1a suggests that the change in the incentive portion of compensation for merger firms will be

the more significant, the purer is the conglomerate merger. In order to test this hypothesis the total sample was partitioned into the two groups according to the purity of merger. Purity of merger was determined based on the type of merger as described in Section 5.1. The regression was run for pure and product type mergers separately. The stronger relationship was expected for the pure type of mergers than the product types. The results are reported in Table 6.4 and summarized below.

i) While the merger variable is consistently significant for both type of mergers, it is clearly more significant for pure rather than product type of merger, as postulated.

ii) Compared with the total sample case, the explanatory power of the model (R^2) increased significantly for the pure type while it decreased for product type.

iii) Ownership structure variables are still insignificant for both types of merger.

iv) For product type mergers, even the EPS change variable was found to be insignificant. This result is somewhat unexpected and difficult to explain.

Although the small sample sizes (pure type: 53 firms and product type: 43 firms) make it difficult to draw any strong conclusions, these results seem to (weakly) support subhypothesis 1a.

Table 6.4
Multiple Regressions For Subhypothesis 1a[a]
(Sample Partitioned by Type of Merger)

Expected Sign		+	-	-	+	
ΔR_1[b] =	b_0 +	b_1MERGER +	b_2OSCHANGE +	b_3MERGER*OS +	b_4EPSCH	R^2
Pure Type (N=53)						
Full Test	-0.138**	+0.179**	-0.004	-0.0004	+0.146**	0.45
	(-3.73)	(3.05)	(-1.06)	(-0.17)	(4.76)	
Short-Form Test	-0.120**	+0.157**	-0.002	+0.0004	+0.142**	0.44
	(-3.45)	(2.84)	(-0.60)	(0.22)	(4.92)	
Product Type (N=43)						
Full Test	-0.037	+0.119	+0.009	-0.0002	+0.019	0.13
	(-0.73)	(1.51)	(1.34)	(-0.08)	(0.56)	
Short-Form Test	-0.054	+0.128*	+0.008	-0.00002	+0.019	0.14
	(-1.10)	(1.68)	(1.17)	(-0.01)	(0.57)	

[a] Numbers in parentheses are t-statistics

[b] ΔR_1 = Change in incentive portion of total compensation from the year before to after merger.

* Significant at 5 % significance level (one tail test).

** Significant at 1 % significance level (one tail test).

Subhypothesis 1b suggests that the results will be the more significant, the larger is the size of the acquired firm relative to that of the acquiring firm because intuitively the managerial incentive problem arising from the diversification effect is expected to be the greater, the larger the acquired firm. The total sample was partitioned into two groups of equal sample size according to the size of acquired firm relative to the acquiring firm. The tests were separately performed for large and small acquired firm groups. The results reported in Table 6.5 are not much different for the two groups of samples. This result is difficult to interpret. Small sample sizes (large group: 47 firms; small group: 49 firms) may be a part of the reason.

6.2.2 Hypothesis 2

Hypothesis 2 suggests that market-based incentive compensation would change after merger relative to accounting-based incentive compensation mainly because of the shareholders' incentive effects arising from the wealth transfer. The same procedures used for Hypothesis 1 are repeated to test Hypothesis 2. The results are reported for the total sample and partitioned samples separately.

6.2.2.1 Total Sample

The results for the total sample are reported in Table 6.6. The sample size was reduced to 75 firms because of instances of zero denominators for the dependent variable. The denominator is now Accounting-Based Incentive

Table 6.5
Multiple Regressions For Subhypothesis 1b[a]
(Sample Partitioned by Size of Acquired Firm)

Expected Sign		+	-	-	?	
ΔR_1[b] =	b_0 +	b_1MERGER +	b_2OSCHANGE +	b_3MERGER*OS +	b_4EPSCH	R^2
Large Size (N=47)						
Full Test	-0.148** (-2.91)	+0.185* (2.06)	-0.007 (-1.43)	+0.0006 (0.23)	+0.065* (1.97)	0.26
Short-Form Test	-0.138** (-2.84)	+0.177* (2.04)	-0.005 (-1.04)	+0.001 (0.41)	+0.061* (1.92)	0.25
Small Size (N=49)						
Full Test	-0.032 (-0.90)	+0.101* (2.03)	+0.009* (2.06)	-0.001 (-0.66)	+0.122** (3.96)	0.30
Short-Form Test	-0.037 (-1.11)	+0.097* (2.09)	+0.008* (1.90)	-0.001 (-0.49)	+0.118** (4.11)	0.31

[a] Numbers in parentheses are t-statistics

[b] ΔR_1 = Change in the incentive portion of the total compensation from the year before to the year after merger.

* Significant at 5 % significance level (one tail test).

** Significant at 1 % significance level (one tail test).

Table 6.6
Multiple Regressions For Hypothesis 2--Total Sample[a]
(N=75)

Expected Sign		+	-	-	?	
ΔR_2[b] =	b_0 +	b_1MERGER +	b_2OSCHANGE +	b_3MERGER*OS +	b_4EPSCH	R^2
Full Test	-0.621** (-2.67)	+1.055** (3.13)	-0.001 (-0.02)	-0.011 (-1.06)	+0.189 (0.61)	0.13
Short-Form Test	-0.390* (-1.81)	+0.677* (2.20)	+0.007 (0.34)	-0.008 (-0.86)	+0.125 (0.45)	0.07

[a] Numbers in parentheses are t-statistics

[b] ΔR_2 = Change in the market based incentive compensation relative to accounting based incentive compensation from the year before to the year after merger.

* Significant at 5 % significance level (one tail test).

** Significant at 1 % significance level (one tail test).

Compensation, measured as (Bonus + Performance Units). If firms that do not have performance units also do not pay bonuses in the years during the test period, zero denominator will result. Expected signs for each independent variable are the same as for Hypothesis 1 except for the change in EPS. It should be noted that the role of EPS variable is now different from that for Hypothesis 1. The dependent variable for Hypothesis 2 is the change in market-based incentive compensation divided by accounting-based incentive compensation. Since both the denominator and numerator are direct (or indirect) functions of EPS, there is no a priori expectation for the sign of the EPS change variable. Therefore, the EPS variable does not clearly serve a control purpose and Hypothesis 2 could be tested without including the EPS variable in the model. This variable was used in order to see if the strong relationship obtained in Hypothesis 1 between the incentive portion of the total compensation and the change in EPS is only by chance, and whether the same result will be obtained for other hypotheses even when there is no such a priori predicted expectation. The results in Table 6.6 show that the EPS variable is not significant for Hypothesis 2.

The other results for Hypothesis 2 are in general similar to those for Hypothesis 1. The only significant variable is MERGER variable, and ownership related variables are not significant at conventional levels, although the signs are generally as expected. The positive sign and

significance of the MERGER variable is interpreted as an indication that the wealth transfer problem created by a conglomerate merger prompted the shareholders to use more market-based incentive compensation relative to accounting-based incentive compensation after the merger, as postulated.

However, the examination of the raw data reported in Table 6.1 reveals a potential problem. The mean of the ratio of (Market-Based Incentive Compensation)/(Accounting-Based Incentive Compensation) seems to be unusually high (0.99) in the year before merger for the control sample, relative to that of merger firms (See Table 6.1) and that reported in the literature. Examination of the five largest of these ratios reveals that the high ratios were caused by some extreme values. Since the dependent variable used in this paper is the change in the ratio during pre- versus post-merger test period, the high ratio in the year before merger alone does not necessarily cause the results to be misleading unless it leads to the extreme values in the dependent variable itself (ΔR_2). Of the five highest ratios examined, three ratios (for the control sample) actually resulted in negative extreme values of the dependent variable. Negative dependent variable values for the control sample have a favorable effect on the test result by pulling down the dependent variable toward the opposite direction of that hypothesized for the merger firms. Therefore, in order to see whether the results are

still significant without the extreme values that caused the favorable effect, additional tests were performed with these extreme value eliminated.[3] The results reported in Table A.5 in the Appendix are still significant and are similar to those with extreme values. Selected ratios after eliminating these extreme values are reported in Table 6.1. The mean ratio (R_2) is now 0.45, which is comparable to that for the merger firms (before merger) and to those reported in other studies. The change in the ratio is still negative. However, a univariate t-test shows that it is not significantly different from zero (t value = -0.75). The negative dependent variable is interpreted to be the result of poor performance in the year after merger as compared with the year before merger (mean EPS change of control firms during the test period is $ -0.56). Thus it is concluded that the extreme values did not affect the basic tenor of the results.

6.2.2.2 Partitioned Samples

As was done in case of Hypothesis 1, similar tests were repeated (for Hypothesis 2) for the subset of samples partitioned according to merger type, and according to the debt ratio of merging firms in the year before merger. The results are expected to be stronger for the pure type merger and when the debt ratio of the merging firms in the year before merger is high. The results reported in Tables 6.7 and 6.8 do not show significant differences for either partition, and therefore both Subhypotheses 2a and 2b are

Table 6.7
Multiple Regressions For Subhypothesis 2a[a]
(Sample Partitioned by Type of Merger)

Expected Sign		+	-	-	?	
ΔR_2[b] =	b_0	+ b_1MERGER	+ b_2OSCHANGE	+ b_3MERGER*OS	+ b_4EPSCH	R^2
Pure Type (N=53)						
Full Test	-0.755*	+1.027*	-0.016	+0.001	-0.120	0.16
	(-2.36)	(2.22)	(-0.58)	(0.03)	(-0.28)	
Short-Form Test	-0.502*	+0.660	+0.001	+0.003	-0.147	0.08
	(-1.73)	(1.58)	(0.04)	(0.23)	(-0.37)	
Product Type (N=43)						
Full Test	-0.437	+1.060*	+0.043	-0.025*	+0.501	0.23
	(-1.28)	(2.15)	(1.15)	(-1.73)	(1.13)	
Short-Form Test	-0.253	+0.667	+0.026	-0.020	+0.452	0.17
	(-0.76)	(1.45)	(0.76)	(-1.58)	(1.08)	

[a] Numbers in parentheses are t-statistics

[b] ΔR_2 = Change in market based incentive compensation relative to accounting based incentive compensation from the year before to after merger.

* Significant at 5 % significance level (one tail test).

** Significant at 1 % significance level (one tail test).

Table 6.8
Multiple Regressions For Subhypothesis 2b[a]
(Sample Partitioned by Debt Ratio)

Expected Sign		+	-	-	?	
	ΔR_2[b] = b_0 +	b_1MERGER +	b_2OSCHANGE +	b_3MERGER*OS +	b_4EPSCH	R^2
High Debt Ratio (N=27)						
Full Test	-0.686	+1.450*	+0.027	-0.007	+0.009*	0.12
	(-1.55)	(2.25)	(0.53)	(-0.39)	(1.97)	
Short-Form Test	-0.109	+0.664	-0.004	-0.005	+0.724	0.11
	(-0.22)	(0.97)	(-0.08)	(-0.28)	(1.38)	
Low Debt Ratio (N=29)						
Full Test	-0.507*	+0.772*	-0.087	-0.008	-0.710*	0.23
	(-1.90)	(2.13)	(-1.48)	(-0.54)	(-1.70)	
Short-Form Test	-0.141**	+0.214**	-0.042**	-0.0004	-0.171*	0.46
	(-2.65)	(2.97)	(-3.58)	(-0.16)	(-2.05)	

[a] Numbers in parentheses are t-statistics

[b] ΔR_2 = Change in the market based incentive compensation relative to accounting based incentive compensation from the year before to the year after merger.

* Significant at 5 % significance level (one tail test).

** Significant at 1 % significance level (one tail test).

not supported. These results may have been influenced by the high standard deviation of the market-based compensation components (see Table 6.1). Also, other factors that may affect firm variance or debt ratio may not have been sufficiently controlled. The small sample size makes it difficult to draw a definite conclusion.

6.2.3 Hypothesis 3

Hypothesis 3 suggests that the long-term portion of compensation relative to short-term compensation would change after merger mainly because of the decision horizon gap between managers and shareholders. The results for the total sample are reported first, followed by the results for the partitioned samples.

6.2.3.1 Total Sample

The results are presented in Table 6.9. The expected signs are the same as for Hypothesis 2. The expected sign for the change in EPS is also ambiguous and its coefficient is expected to be insignificant because both numerator and denominator are functions of the firm's performance. The results indicate that the merger variable is significant. Also, the change in EPS turned out to be significant. The other variables are insignificant although the signs are as expected in most of the cases.

6.2.3.2 Partitioned Samples

The results of partitioned samples are reported in Tables 6.10 and 6.11. The results are similar to those for Subhypothesis 1a and 1b.

Table 6.9
Multiple Regressions For Hypothesis 3--Total Sample[a]
(N=96)

Expected Sign		+	-	-	?	
	ΔR_3[b] = b_0 +	b_1MERGER +	b_2OSCHANGE +	b_3MERGER*OS +	b_4EPSCH	R^2
Full Test	-0.281_{**} (-3.26)	$+0.425_{**}$ (3.13)	-0.005 (-0.53)	-0.002 (-0.54)	$+0.111_{*}$ (1.79)	0.14
Short-Form Test	-0.221_{**} (-2.98)	$+0.278_{**}$ (2.36)	-0.003 (-0.43)	$+0.0001$ (0.03)	$+0.087_{*}$ (1.63)	0.10

[a] Numbers in parentheses are t-statistics

[b] ΔR_3 = Change in the long-term compensation relative to the short-term compensation.

* Significant at 5 % significance level (one tail test).

** Significant at 1 % significance level (one tail test).

Table 6.10
Multiple Regressions For Subhypothesis 3a[a]
(Sample Partitioned by Merger Type)

Expected Sign		+	-	-	?	
ΔR_3[b] =	b_0 +	b_1MERGER +	b_2OSCHANGE +	b_3MERGER*OS +	b_4EPSCH	R^2
Pure Type (N=53)						
Full Test	-0.371**	+0.517**	-0.005	-0.003	+0.207*	0.18
	(-2.73)	(2.40)	(-0.36)	(-0.31)	(1.83)	
Short-Form Test	-0.247*	+0.290	-0.003	+0.001	+0.154	0.11
	(-2.09)	(1.54)	(-0.29)	(0.21)	(1.56)	
Product Type (N=43)						
Full Test	-0.175*	+0.346**	+0.013	-0.003	+0.014	0.15
	(-1.81)	(2.29)	(0.96)	(-0.67)	(0.21)	
Short-Form Test	-0.200**	+0.288*	+0.007	-0.001	+0.017	0.13
	(-2.32)	(2.15)	(0.61)	(-0.35)	(0.30)	

[a] Numbers in parentheses are t-statistics

[b] ΔR_3 = Change in the long-term compensation relative to the short-term compensation from the year before to the year after merger.

* Significant at 5 % significance level (one tail test).

** Significant at 1 % significance level (one tail test).

Table 6.11
Multiple Regressions For Subhypothesis 3b[a]
(Sample Partitioned by Size of Acquired Firm)

Expected Sign		+	-	-	?	
ΔR_3[b] =	b_0 +	b_1MERGER +	b_2OSCHANGE +	b_3MERGER*OS +	b_4EPSCH	R^2
Large Size (N=47)						
Full Test	-0.402**	+0.471*	-0.012	-0.001	+0.105	0.14
	(-2.61)	(1.71)	(-0.81)	(-0.08)	(1.05)	
Short-Form Test	-0.296*	+0.272	-0.008	+0.002	+0.083	0.09
	(-2.18)	(1.12)	(-0.64)	(0.32)	(0.94)	
Small Size (N=49)						
Full Test	-0.108	+0.312**	+0.015	-0.005	+0.086	0.19
	(-1.43)	(2.92)	(1.58)	(-1.23)	(1.31)	
Short-Form Test	-0.116*	+0.231**	+0.070	-0.003	+0.075	0.16
	(-1.85)	(2.61)	(1.28)	(-0.77)	(1.37)	

[a] Numbers in parentheses are t-statistics

[b] ΔR_3 = Change in the long-term compensation relative to the short-term compensation from the year before to after merger.

* Significant at 5 % significance level (one tail test).

** Significant at 1 % significance level (one tail test).

6.2.4 Analysis with Multivariate Dependent Variable

Previous sections reported on multivariate analysis pertaining to independent variables. This section discusses and reports on an analysis that combines the three individual dependent variables into one multivariate (vector) dependent variable.

Conceptually, each of the individual dependent variables(ΔR_1, ΔR_2 or ΔR_3) relates to a different dimension of the agency problems between the manager and the shareholders. All of these agency problems are interrelated to a certain degree in that they originate from a common source--the change in the risk characteristics of the firm through a conglomerate merger. Also, careful examination of the definition of each dependent variable indicates that each is significantly empirically correlated with each of the others. This implies that the dependent variables can be combined into a multidimensional vector (of ratios) that captures the change in the structure of management compensation as a result of a change in firm characteristics. Thus, it is interesting to examine the relationship between the vector of dependent variables and the different independent variable in the model(s). For this purpose, a typical multivariate analysis of variance (MANOVA) was run.[4] The results are reported in Table 6.12. The tenor of the results here mirrors that for the individual dependent variable tests: The MERGER variable is significant, and so is the EPS change variable.

Table 6.12
Multivariate Analysis of Variance[a]
(Full Test--Total Sample)
(N=75)

Expected Sign	+	-	-	?
$\begin{matrix}\Delta R_1 \\ \Delta R_2 \\ \Delta R_3\end{matrix}$[b] = b_0 + b_1MERGER + b_2OSCHANGE + b_3MERGER*OS + b_4EPSCH				
F Value[c]	3.30 (0.03)	0.77 (0.51)	0.27 (0.95)	3.92 (0.01)

[a] The numbers in parentheses are PROB > F.

[b] ΔR_1, ΔR_2, and ΔR_3 were previously defined. The dependent variable is a vector of these ratios.

[c] F value is based on Wilks' criterion.

6.3 Notes

1. Murphy (1983) reports the following compensation data (deflated to 1983 constant dollars) for the top executives of 72 sample firms: salary $ 271M, bonus $ 129M, stock options $ 50M. The Wall Street Journal (February 28, 1986) reports that for firms comparable in size to those used in this study, average salary and bonus for the top executive (for 1985) are $ 276M and $ 130M, respectively. Also, the following compensation proportions as a percentage of total compensation are furnished in the Journal: salary 50 %, bonus 25%, long-term compensation (including stock options) 25 %.

2. Also, the interaction effect between MERGER and EPSCH was tested. This tests whether the effect of earnings on management compensation is different between merger and control firms. The results presented in A.6 in Appendix show that this term is not significant and there is little change in the significance of other variables.

3. The same problems were encountered for R_3. This resulted in the elimination of additional three observations. Therefore, the total number of firms used for this test is 95 (one company had extreme values for both R_2 and both R_3).

4. In this study, the focus is on the specific aspects of agency problems created by a conglomerate merger, and not on the change in firm characteristics as a whole. Therefore, MANOVA is used only as a supplementary test.

CHAPTER VII
SUMMARY AND CONCLUSIONS

This chapter presents a brief summary of the findings of this study and the inferences that can be drawn therefrom. Certain limitations of the study and their implications are also explored. Finally, the contribution of this study and possible future research extensions are discussed.

7.1 Summary and Conclusions

The goal of this study was to examine the change in the structure of management incentive compensation in response to the agency problems created by a conglomerate merger. The specific agency problems discussed were a potential reduction in managerial effort, the potential wealth transfer from the shareholders to bondholders, and the decision horizon gap between shareholders and managers. The degree of control exercisable by owners (ownership structure) was then introduced as an additional factor that mitigates or accentuates the magnitude of the agency problems created by a conglomerate merger.

In particular, Hypothesis 1 proposed that the potential reduction in managerial effort arising from the pooling of uncorrelated or negatively related earnings streams after

merger would drive the shareholders to increase the incentive portion of total management compensation in order to motivate the managers. Hypothesis 2 posited that the potential for wealth transfer would lead to a greater utilization of market-based incentive compensation relative to accounting-based incentive compensation. The results of multiple regression presented in Chapter VI (and the univariate tests in Appendix) strongly support both of these expectations. That is, the incentive portion and the market-based compensation of merger firms increased significantly after merger as compared with non-merger control firms. Hence it may be inferred that the structure of management compensation is strategically altered by shareholders in response to the managerial agency problems created by a conglomerate merger.

Additionally, it was anticipated that the ownership structure would significantly change after merger and this change would influence the change in the structure of management compensation by itself as well as in interaction with the agency problems created by a conglomerate merger. The ownership variables, however, were found to be insignificant (and the signs were somewhat mixed) in affecting the change in the structure of management compensation. The absence of effect may be due to i) the ownership variables, as measured by the percentage of stock holdings held by the major stockholders, not being a good a proxy for the monitoring ability of shareholders, and/ or

ii) the change in the ownership structure through merger not being sufficient enough to permit the detection of the anticipated relationship.

The above tests were conducted on a total sample of 47 merger firms and 49 non-merger control firms. To explore the effect of finer partitions, tests were repeated on the subset of samples partitioned on merger type, size of the acquired firm, and debt ratio of merging firms. It was anticipated that the results would be stronger for the pure type (rather than product type) merger, when the size of the acquired firm (for Hypothses 1 and 2) was larger, or when the debt ratio of merging firms (for Hypothesis 2) was higher. Although the pure type merger exhibited a stronger relationship, the size and debt ratio related hypotheses were not supported. Both partitions attempted to proxy for the relative magnitude of anticipated agency problems.

All of analyses were performed using i) all the components of the management compensation package (the "full" test), and ii) excluding performance based long-term compensation such as performance plans and restricted stocks (the "short-form" test). The results of both tests are quite similar.

7.2 Limitations and Suggestions for Future Research

Although a theory of the design of managerial compensation should seek to identify all the factors that determine the structure of incentive compensation, this

study provides a limited initial exploration of the area. As with any other exploratory work, this effort has many limitations. Some of these limitations are as follows.

Since this study examines the effect of conglomerate merger on the change in the structure of the management compensation package, the most appropriate test of the hypothesis would be to directly look into the detailed specifications of the incentive compensation package to see whether any changes in the specifications and in the compositions of the package could be attributed to the merger. Because outside researchers are not privy to the detailed contents of management compensation packages, this proposal examined the changes in ex-post compensation data that were actually paid to the managers. From this, an inference was made as to whether there were any changes in the structure of the compensation package. For example, the increase in the payment of market-based compensation after merger is assumed to be due to a change in the structure of the compensation package in such a way that increases the market-based portion. This change in the structure of management compensation is then interpreted as shareholders' response to the wealth transfer created by a conglomerate merger. However, this type of inference is not always warranted. Stock-based compensation may increase because of other economic or institutional factors. Also, a simple alternative explanation may be that the top managers are awarded stock options, for example, as a reward for

successful merger negotiations. These awards need not be related to the agency problems between managers and shareholders, and thus create a potential interpretation problem.

Another potential interpretation problem is related to the timing of measurement of compensation. As described in Chapter V, this study measures compensation only for the year before and the year after merger. The year of merger was not included because compensation data for that year can not be broken down neatly into two parts--the periods before and after the "announcement date" of the merger. Hypothesis 2 proposes an award of market based compensations to induce the managers to take shareholder wealth protection measures in response to the anticipated wealth transfer. Such measures would include i) use of debt as an exchange of medium in merger, ii) calling of existing debt after merger at a lower interest rate, iii) increase in debt after merger, and iv) taking variance increasing projects after merger. If actions i) through iv) have already been taken place or planned by management in connection with merger, but, independently of changes in compensation structure, then the effects on compensation hypothesized in this study may be either diluted or confounded (especially in case of Hypothesis 2).

Further, this study did not explicitly compute the magnitude of the decrease in firm variance after merger. Since the decrease in variance is the source that creates

agency problems, a direct measure of the decrease in firm variance after merger may provide further insight on the relationship between the degree of agency problems and design of management compensation. However, given the non-stationarities in firm operations over time, it is not easy to identify the portion of any change in variance that is attributable to a merger event.

Another potential limitation is that tax effects are not considered in this study. The analysis of Miller and Scholes (1982) indicates that most long-term incentive plans have tax implications. However, Smith and Watts (1982, 1984) suggest that these plans also have incentive effects. Therefore, Hypothesis 3 does not differentiate between tax and incentive effects.

Lastly, this study assumes that the owners of a company, through its board of directors and the compensation committee, have effective control over the compensation paid to top management. This assumption is consistent with that made in the analytical work on which this study is built. However, this assumption may not sufficiently represent reality especially when no shareholder has a significant proportion of ownership. Some studies have reported that top management significantly influence the compensation committee (see Bacon, 1982 and The Wall Street Journal, February 28, 1986). Even in this case though, there is a countervailing argument that managers do not have complete freedom to do as they wish. They are still subject to the

general discipline of the managerial labor market and the market for corporate control. These latter forces may induce managers, as agents, to offer bonding arrangements to the owners that effectively substitute for contracts imposed by the owners. Unfortunately, the potency of these alternate forces is open to question.

APPENDIX

SOME ADDITIONAL TESTS

Table A.1 Univariate Analysis for Merger and Non-Merger Firms.

Table A.2 Multiple Regressions Using Dichotomous Variables for Ownership Interests.

Table A.3 Multiple Regressions Using Total Stockholdings for Ownership Interests.

Table A.4 Multiple Regressions Using Change in Net Income (NICH).

Table A.5 Multiple Regressions with Extreme Values Eliminated.

Table A.6 Intertaction Effect Between MERGER and Change in EPS.

Table A.1
Univariate Analysis (Wilcoxon Rank Sum Test) for Merger and Non-Merger (Control) Firms (Full Test--Total Sample)

Variable	Merger Firms		Non-Merger Firms
ΔR_1:			
Mean Score	56.7		40.7
T-Test Approx.		2.81	
ΔR_2:			
Mean Score	43.6		30.8
T-Test Approx.		-2.53	
ΔR_3:			
Mean Score	55.5		41.8
T Test Approx.		2.42	
OSCHAGE:			
Mean Score	45.9		51.0
T-Test Approx.		-1.02	
MERGER*OS:			
Mean Score	73.0		25.0
T-Test Approx.		0.2	
EPSCH:			
Mean Score	49.0		48.0
T-Test Approx.		0.18	

Table A.2
Multiple Regressions Using Dichotomous Variables
for Ownership Interest (Full Test - Total Sample)[a,b]

Expected Sign	+	-	0	0	-	+(? for Hypotheses 2 and 3)	
	b_0 +	b_1MERGER+	b_2OS1+	b_3OS2+	b_4OS4+	b_5MERGER*OS+	b_6EPSCH R^2
Hypothesis 1 (N=96)	+0.02 (0.19)	+0.12 (2.31)**	+0.17 (-1.27)	+0.10 (0.58)	-0.11 (-0.81)	+0.10 (1.03)	+0.10 (4.23)** 0.26
Hypothesis 2 (N=75)	-0.23 (-0.30)	+1.04 (2.73)*	-0.41 (-0.46)	-1.21 (-0.92)	-0.42 (-0.50)	-0.22 (-0.31)	+0.11 (0.33) 0.13
Hypothesis 3 (N=96)	+0.02 (0.06)	+0.35 (2.42)**	-0.51 (-1.35)	-0.09 (-0.19)	-0.25 (-0.68)	+0.20 (0.75)	+0.13 (1.94) 0.16

[a] The numbers in parentheses are t-statistics.

[b] Ownership structure variables are defined as follows.

OS1	1	if % stock holding is greater than 10 % before and after merger.
	0	otherwise
OS2	1	if % stock holding is greater than 10 % before merger but less than 10 % after merger.
	0	otherwise
OS4	1	if % stock holding is less than 10 % before and after merger.
	0	otherwise
OS	1	if % stock holding after merger is greater than 10 %.
	0	otherwise

* Significant at 5 % significance level (one tail test).
** Significant at 1 % significance level (one tail test).

Table A.3
Multiple Regressions Using Total Stockholdings for Ownership Interests[a]
(Full Test--Total Sample)

Expected Sign	+	-	-	+(? for Hypotheses 2 and 3)	
	b_0 +	b_1MERGER +	b_2OSCHANGE +	b_3MERGER*OS+	b_4EPSCH	R^2
Hypothesis 1 (N=96)	-0.087** (-2.74)	+0.131** (2.43)	-0.002 (-0.81)	+0.0005 (0.37)	+0.083** (3.83)	0.22
Hypothesis 2 (N=75)	-0.633** (-2.71)	+1.025** (2.78)	+0.004 (0.27)	-0.005 (-0.51)	+0.191 (0.61)	0.12
Hypothesis 3 (N=96)	-0.280** (-3.18)	+0.404** (2.70)	-0.002 (-0.26)	-0.002 (-0.05)	+0.113* (1.79)	0.14

[a] The numbers in parentheses are t-statistics.

* Significant at 5 % significance level (one tail test).

** Significant at 1 % significance level (one tail test).

Table A.4
Multiple Regressions Using Change in Net Income (NICH)
(Full Test--Total Sample)

Expected Sign	+	-	-	+(? for Hypotheses 2 and 3)	
	b_0 +	b_1MERGER +	b_2OSCHANGE +	b_3MERGER*OS +	b_4NICH	R^2
Hypothesis 1 (N=85)	-0.075_{*} (-2.19)	$+0.109_{*}$ (1.89)	-0.004 (-1.16)	+0.0003 (0.16)	$+0.137_{**}$ (3.62)	0.20
Hypothesis 2 (N=64)	-0.625_{**} (-2.47)	$+1.009_{**}$ (2.61)	+0.002 (0.09)	-0.003 (-0.20)	+0.260 (0.80)	0.12
Hypothesis 3 (N=85)	-0.255_{**} (-2.79)	$+0.342_{**}$ (2.22)	-0.006 (-0.65)	-0.001 (-0.22)	+0.144 (1.43)	0.10

[a] The numbers in parentheses are t-statistics.

* Significant at 5 % significance level (one tail test).

** Significant at 1 % significance level (one tail test).

Table A.5
Multiple Regressions with Extreme Values Eliminated[a]
(Full Test--Total Sample)

Expected Sign	+	-	-	+(? for Hypotheses 2 and 3)	
	b_0 + b_1MERGER +	b_2OSCHANGE +	b_3MERGER*OS +	b_4EPSCH	R^2
Hypothesis 1 (N=91)	-0.047* (-1.48)	+0.10 * (2.03)	-0.002 (-0.71)	+0.00001 (0.01)	+0.070** (3.27)	0.16
Hypothesis 2 (N=70)	-0.138 (-0.74)	+0.557* (2.13)	-0.015 (-0.93)	-0.011 (-1.40)	+0.273 (1.16)	0.11
Hypothesis 3 (N=91)	-0.072* (-1.30)	+0.220** (2.61)	-0.002 (-0.03)	-0.002 (-0.93)	+0.042 (1.10)	0.09

[a] The numbers in parentheses are t-statistics.

* Significant at 5 % significance level (one tail test).

** Significant at 1 % significance level (one tail test).

Table A.6
Interaction Effect Between MERGER and Change in EPS
(Full Test--Total Sample Sample)[a]

Expected Sign	+	-	-	?	+(? for Hypotheses 2 and 3)	
	b_0+	b_1MERGER+b_2OSCHANGE+b_3MERGER*OS+b_4MERGER*EPSCH+b_5EPSCH				R^2
Hypothesis 1 (N=96)	-0.08 (-2.38)	+0.14** (2.76)	-0.003** (-0.94)	-0.0001 (-0.51)	+0.04 (0.61)	+0.09** (3.46)	0.22
Hypothesis 2 (N=75)	-0.63 (-2.69)	+1.06** (3.14)	-0.001** (-0.07)	-0.01 (-1.07)	+0.33 (0.53)	+0.002 (0.00)	0.14
Hypothesis 3 (N=96)	-0.26 (-2.93)	+0.40** (2.91)	-0.005** (-0.59)	-0.002 (-0.52)	+0.09 (0.45)	+0.10 (1.58)	0.13

[a] The numbers in parentheses are t-statistics.

* Significant at 5 % significance level (one tail test).

** Significant at 1 % significance level (one tail test).

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BIOGRAPHICAL SKETCH

Kooyul Jung was born in Seoul, Korea, on July 20, 1949. Mr. Jung was raised and educated in Seoul except for the period of the Korean War. He graduated from Kyunggi High School in February 1968 and the next month entered Seoul National University where he finished his undergraduate work in Business Administration. After completing three years of mandatory military service in the Korean Army in January 1976, he pursued his master's degree at University of Santa Clara, where he received a full scholarship for the two year MBA program from August 1976 to August 1978.

After passing the CPA exam, Mr. Jung briefly worked for Deloitte, Haskins and Sells (Baltimore office) and returned to Korea, where he practiced in Ahn, Kown & Co.,CPAs' as a supervisor and a manager from April 1980 to July 1982. He started his Ph.D. program at University of Florida in August 1982.

Mr. Jung married Donghyun on May 25, 1976, and has two sons, Junyeong and Christopher.

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Bipin Ajinkya, Chairman
Professor of Accounting

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy. .

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This dissertation was submitted to the Graduate Faculty of the Fisher School of Accounting in the College of Business Administration and to the Graduate School and was accepted as partial fulfillment of the requirements for the degree of Doctor of Philosophy.

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